

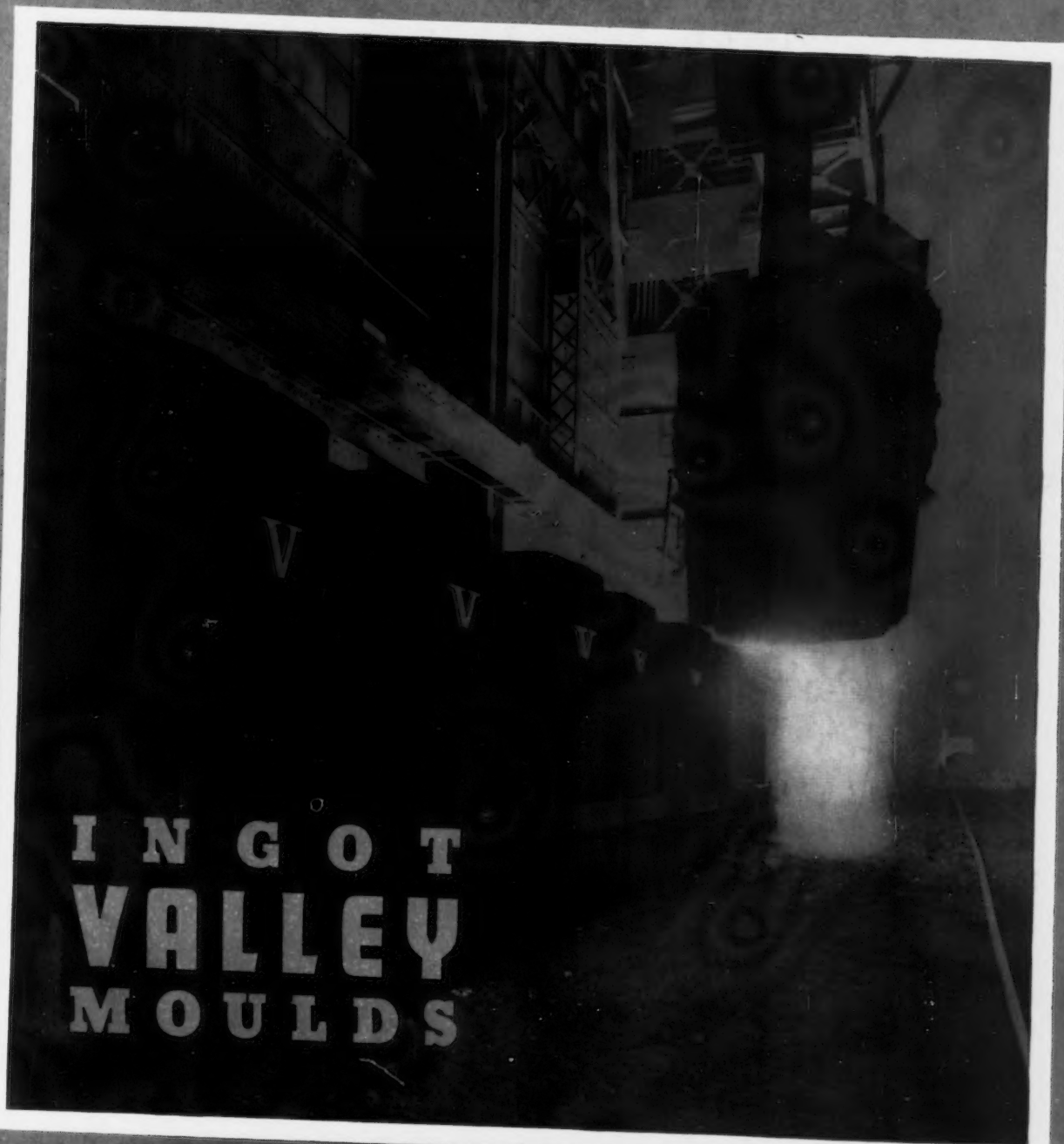
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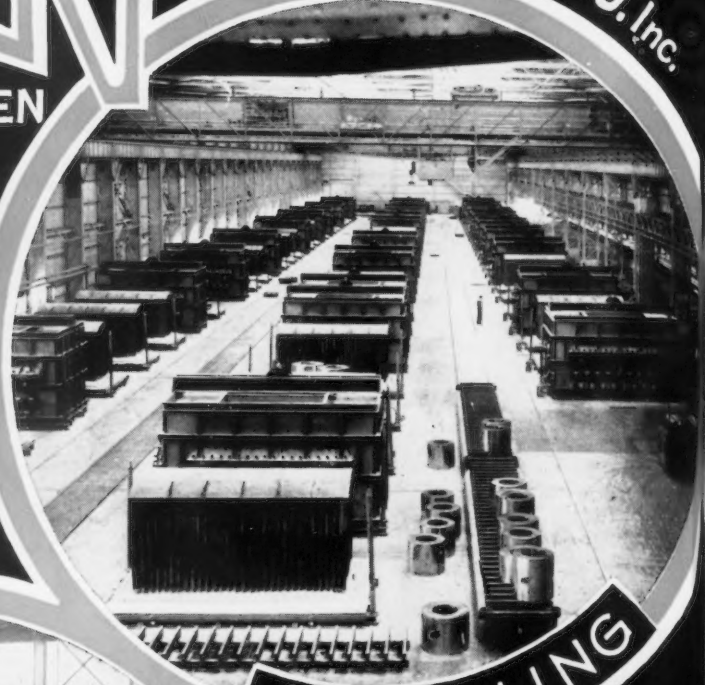
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# This Week in The Iron Age

JANUARY 16, 1941

VOL. 147 NO. 3

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# The Iron Age

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## Multiple Heads

THE "multiple-head" idea is one well known in our industry. The idea is to get work done faster by having tools work simultaneously instead of singly on a job. Today we can find many examples of multiple-head tooling in our machine shops and particularly in our mass production industries. Through the use of this principle we are able to machine automobile cylinders in minutes instead of days or weeks. And that is one of the reasons why we have so many cars available for so little money.

The multiple-head idea is not new. It goes back to mythology. Janus, the "keeper of the gates" had two heads so that he could look both ways at once to see who was coming.

Cerberus, the fabled dog that guarded the gates of hell, is said to have had three heads. Since "war is hell," that may be where the idea came from that has given us a multiple-headed defense production authority.

Now we of the metal working industry appreciate the value of multiple-heads—when they are used in the right place. But we know that they won't work in the front office.

Restricted to their proper use in the shop and to their function of mechanically carrying out, in endless repetition, the sequences that their designer built into them, multiple-head machines do their work to perfection. There is never any argument between them because they are inanimate mechanisms without authority or without judgment.

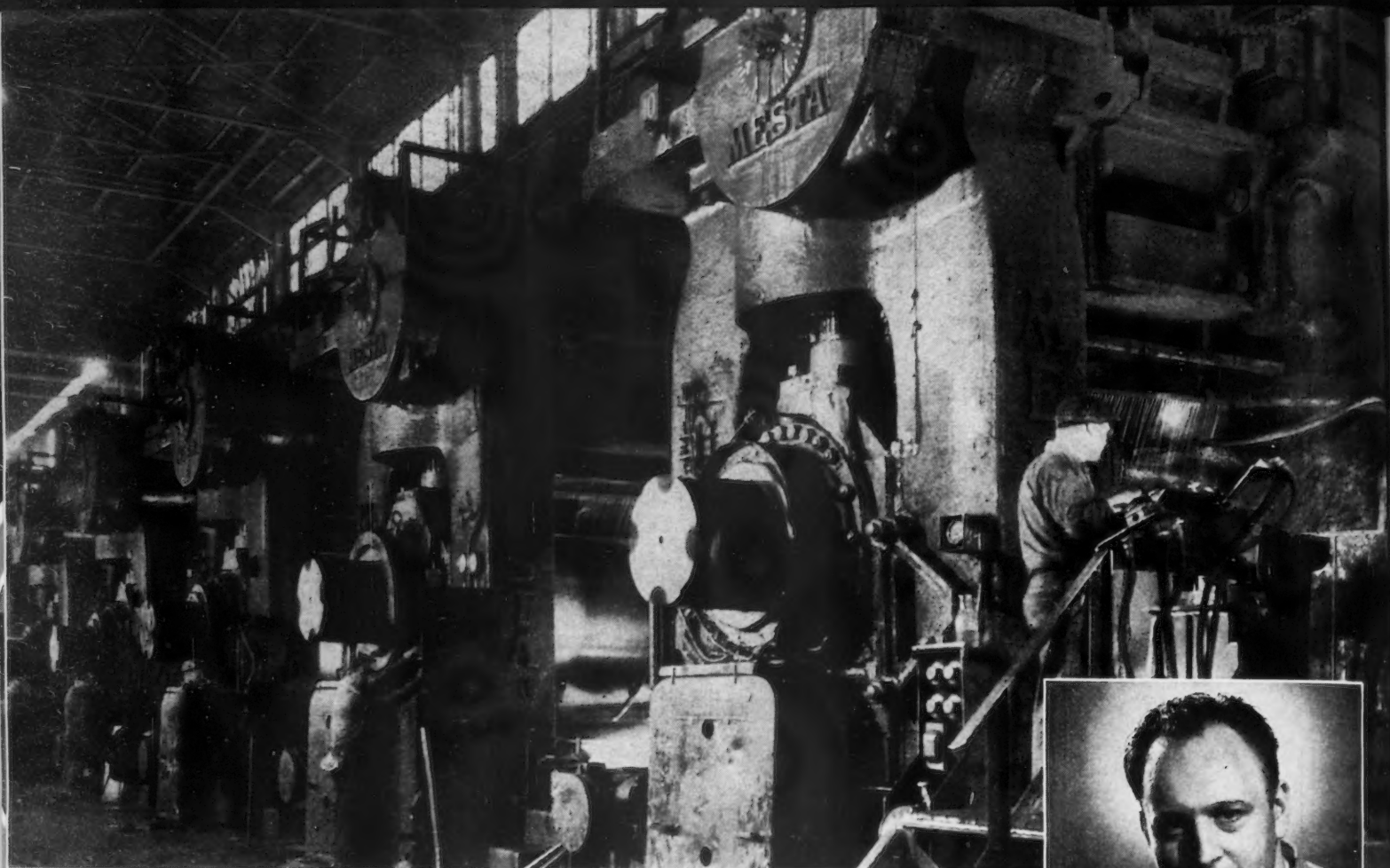
When it comes to performing work, one head does not say to the other: "Now I think that it should be done this way" and the other counter with: "I believe that this way would be better." They just go and do it as they have been built to do it.

If these multiple-heads were endowed with the power of making personal decisions it would be just too bad, for any difference of opinion between them would undoubtedly wreck the machine.

When it comes to the matter of organization and its administration, every cardinal rule of good management points to the use of a single head. That is why we have one President instead of half a dozen; one police chief in a city instead of three or four; one man in supreme charge of production in every successful factory.

Mr. Knudsen and Mr. Hillman are both able and admirable Americans. Both of them probably appreciate Democracy and its privileges more than most of us, having reached success in this country from humble immigrant beginnings. No two men probably could or would work in closer harmony. But it is not good management to have a multiple-headed production authority for America. It just won't work.

*J. H. Hillman*



## *Modern Mills and Skilled Men* CARRY ON THE

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# Shell Forging

## by the Upset Method

By W. W. CRILEY

General Manager, Ajax Mfg. Co.,  
Cleveland

SHELL forging practice has changed considerably since the World War days. This article describes one of the several methods now available which will produce cavities close enough to size to obviate the need for subsequent boring operations.

o o o

IN 1933 the Ajax Mfg. Co. successfully developed the displacement piercing method of forging artillery shells on an upsetting forging machine and produced shells for the U. S. Ordnance Department to demonstrate not only the feasibility of the process but to establish the satisfactory physical characteristics of the shell forgings on the proving grounds. These shells had the cavities "forge-finished" to sufficiently close tolerance so that no internal machining or boring was necessary and were held to an accuracy of concentricity which decidedly reduced the amount of metal to be removed by machining from the exterior.

The dies and tools, and a finished double ended 75 mm. shell forging, also operations split in half, are

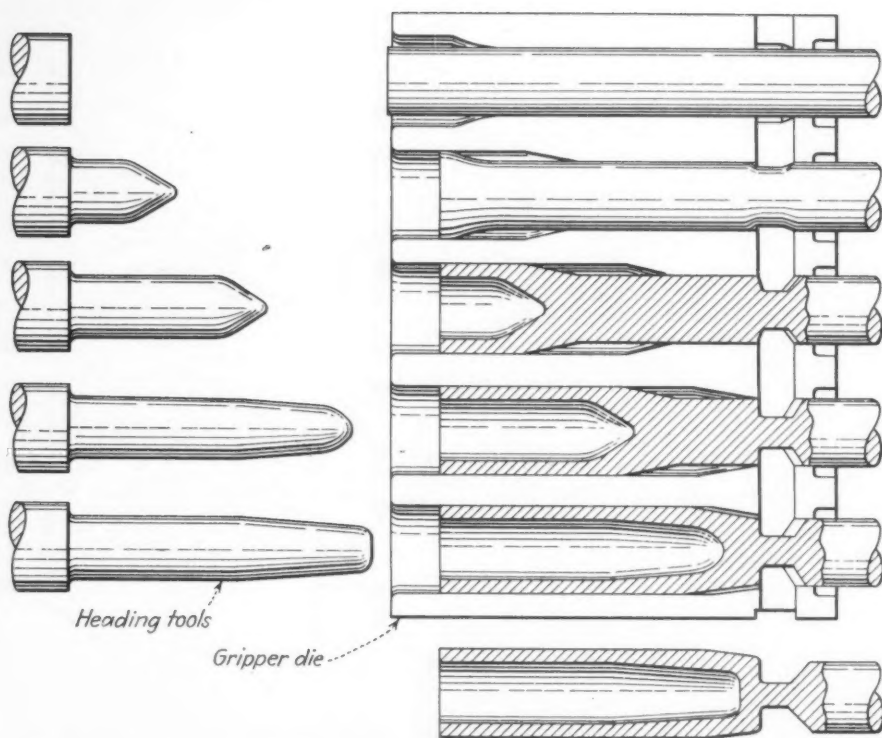
shown in one of the photographs. The dies and tools are provided with five operations or positions for forging: First, buttoning or upsetting the end of the bar to the full outside diameter of the finished shell forging, and then progressively piercing in the second, third, fourth and fifth operations. After the first operation the length of the forging is constant, and the piercing merely expands the metal to fill the die cavity without further upsetting or extrusion. The small connecting piece is the only waste over the amount that is left for finish on the outside of the shell. The shell cavity is forged to size and no machining of the bore is necessary.

The outline drawing shows the general arrangement of the die impressions and piercing or heading tools for shell production in an upsetting forging machine, and makes clear the internal displacement of the metal during the progressive piercing operations. In the first die impression the bar is shown in place before the heading tool has acted upon it. In the second groove the upset bar from the first operation is shown in place before the first piercing tool has acted upon it. Likewise in grooves numbers 3, 4

and 5, the piece is shown in place as completed in the previous die but before being acted upon by the piercing or heading tool opposite the particular die impression. The nicker plate near the right hand end of the die progressively necks down the bar to form the small diameter connecting piece between the shell forging and the bar. This neck constitutes the only waste in the forging and amounts to but a fraction of a pound of metal.

This method is the practice still being followed at the Frankford Arsenal, for whom these dies were originally developed. However, subsequent production indicates that it is desirable to go to a six operation die, forming a collar on the end of the forging in the first operation to establish and hold length, and trimming the collar off in the fifth operation. This additional operation does not cut down the production because the collar facilitates the accurate locating of the piece in the various die impressions.

While originally the forging was done in a 4-in. upsetting forging machine, and still can be, the preference now is to forge the shell in a 5-in. forging machine because of greater die height, rigidity, power and more reserve capacity for sus-



Progressive steps in the forging of a 75-mm. shell in an upsetting forging machine by the displacement piercing method. The completed forging, necked to an unforaged blank bar is shown at the bottom of the sketch. In actual practice, of course, the piece is moved from groove to groove progressively downward and one shell is completed every five strokes of the machine. Redesign of the cavity end from the form shown has resulted in greatly increased piercer life.



Gripper die halves and header and piercing tools carried in the header slide of a 4-in. forging machine. This set was made for the production of 75-mm. shell, which is shown on the floor cut in half to indicate the displacement of the metal from the bore to the enlarged outside diameter in successive stages. A shell forging  $3\frac{1}{8}$  in. outside diameter and  $2\frac{1}{8}$  in. inside diameter is made from  $2\frac{3}{8}$  in. bar stock. More recently, six-impression dies have been used for this work on 5-in. machines.

tained production. Such a machine, for example, can also forge 90 mm. shells if desired, and also the 81 mm. trench mortar shell.

In the usual method, bar stock is sawed, sheared or nicked and broken to a length sufficient for producing two shell forgings. After one shell has been forged, the other end of the bar is heated and the first shell then serves as a tong hold while the second shell is being forged. This permits inspection of one end of the stock which goes into each shell forging, and since constant weight blanks are being handled, a simple counterbalance or manipulator is used at the upsetter to relieve the operator entirely of this weight during transfer from die to die. A variation from this method is to pinch the first shell off during the last forging operation and handle the blank for the second forging by the small, necked-down section, as a tong hold. Here again a counterbalance can be used by reducing the counterweight when the single blanks are being forged and the separate operation for shearing the



shell forgings apart is entirely dispensed with.

Still another method of handling where furnace facilities warrant is to forge shell off the end of bars about 10 ft. long. For all these methods the dies and tools are essentially the same as those described with the exception that in the modified methods the nicker plates pinch the forgings entirely off the bar in the last operation, and when operating on long bars shear knives are provided in the back of the dies to snip off the distorted end of the bar prior to making the next forging. The scrap weight is about the same as by the former method. By any of the methods mentioned, the shape and surface condition of the pierced hole are of such accuracy

working at two furnaces, a man to swab the piercers with hot die lubricant and to direct water on them after each forging is made, and lastly a man to handle the forging from the machine to an air blast. Air cooling is necessary to maintain the specified hardness

tools shown in the illustrations were built had a flat bottom at the closed end of the cavity, which shape did not lend itself particularly well to piercing. The present 75 mm. shell now in production has a redesigned cavity shape with a generous radius at the bottom in place of a flat and a long sweeping curve connecting the end radius with the straight portion of the cavity. This is a much more favorable shape for piercing, has less tendency to score the piercer and results in an average tool life of 6000 to 7000 forgings per piercer in the last two operations and about twice that in the other operations. Exceptional runs of twice this number have been made before the tolerance of the shell cavity in



Tools and dies for producing a 5-in. anti-aircraft shell forging. In this set-up, the bar is not only upset but also pierced a short distance in the first operation. This procedure facilitated the centering of the piercing tool in the second operation. The final cavity in the shell is of greater diameter than the original bar stock.

and smoothness that boring or reaming is unnecessary. The only operation performed in the shell cavity after forging is shot blasting.

#### Economic Factors

Not including furnaces and handling equipment, one Ajax 5-in. forging machine with a complete set of dies and tools, together with 60-hp. motor and electrical controls installed will represent an outlay of approximately \$55,000. One machine with a crew of about six or seven men will produce an average of 65 to 75 shells of 75 mm. size per hr. after they have become reasonably experienced. The crew will include the operator, three helpers

without resorting to subsequent heating and quenching. A highly skilled crew could probably turn out as many as 85 forgings per hr., but this is at present the upper limit as far as piercer life is concerned. The machine itself is capable of much higher production.

The original shell for which the

dimensions and smoothness have called for piercer replacement.

The impressions in the die blocks are good for 20,000 to 25,000 shells per sinking and can be redressed about four times. The cost of re-sinking the impressions or inserting locations where wear is most rapid is very nominal when prorated against this high production. Power costs will depend upon local rates, but this factor and the initial outlay is purely incidental as compared with the corresponding item on hydraulic operated units. No royalties are involved as the method is not patented.

Shell forgings produced by the upsetter method have superior frag-

mentation and conform to Ordnance Department specifications in all respects. The 75 mm. anti-aircraft shell forging requires approximately 17 lb. of forging stock including tong hold and depending upon die wear. Rejects should not exceed 2 or 3 per cent if careful inspection is maintained during forging so that production is halted when shells begin to exceed the allowable tolerances.

Shells as large as the 5-in. anti-aircraft have been forged on a standard 6-in. Ajax forging machine, following the same practice as described above, and there is no question that it would be entirely practical to produce larger shells up to the limit of capacity of the 7-in. machine, which is the largest standard size available.

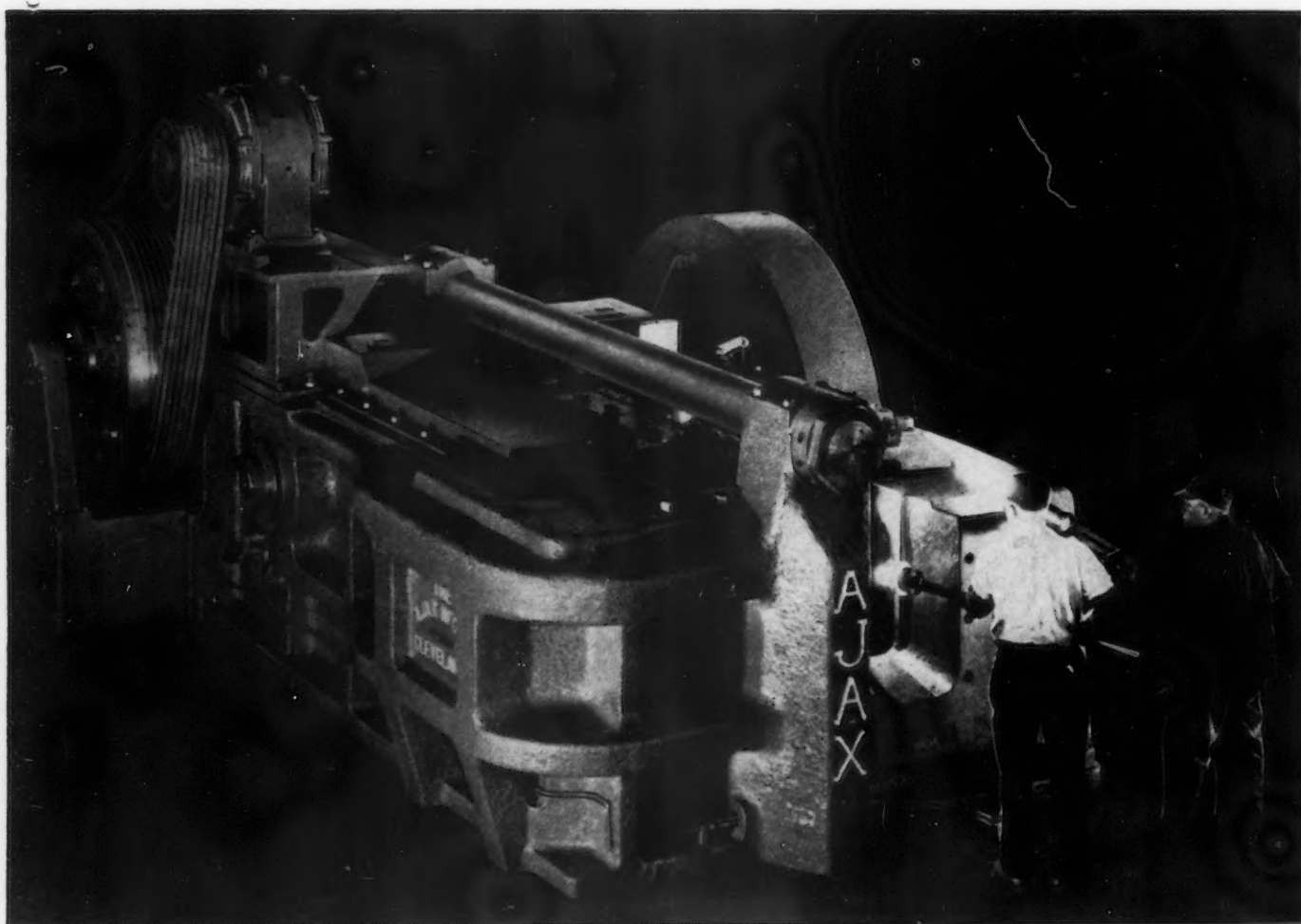
Availability of equipment is one of the most important factors to be taken into consideration by prospective users of this method. There are so many other vital requirements for forging machines for use in defense production, that it is questionable how many will be available for shell production. Upsetters

are necessary for producing aircraft forgings, including motor cylinders, pistons, propellers and others; forgings for tank construction, trucks and armored cars; diesel engine forgings, and many others. Buying of forging machines is active, and orders to date are all voluntary on the buyer's part. As this article is written, deliveries on forging machines in the shell forging range were running from five to eight months from receipt of order.

In World War days, 75 mm. shells were forged with liberal external allowance for machining and with undersized cavity, which had to be both rough and finish bored before charging with high explosive. This internal finishing represented an enormous waste of material as well as the time to perform the operation and the amount of equipment necessary to do it. Elimination of this laborious and expensive internal machining operation is due to improved forging technique and in a great measure to improvement in forging machine construction and the ability of the modern ma-

chines, which have been developed in the interim, to hold forgings to present day close tolerances on long production runs.

Present day machines are much heavier, sturdier, and better aligned. In Ajax machines, for example, there is an underarm guided header slide extension which prevents tilting of the slide within its guides by the tremendous off-center pressures developed in multi-stage dies, such as those illustrated, with operations far displaced above or below the horizontal center line. Similarly there is an outboard guide on the die slide which carries the moving portion of the die into perfect match with the stationary die and holds the pair solidly together against the offsetting and spreading pressures developed during piercing. The speed at which these modern machines operate is also of primary importance in completing these progressive piercing operations before the bar loses its heat. With a high-speed machine employing a direct acting air clutch, production is limited only by what is consistent with reasonable tool life.





# The Perrin Process

—A discussion of extensive experiments on this method of rapidly refining steel at the plant of Tata Iron & Steel Co., Ltd., India.

THE rapid refining of steel by means of mechanical mixing of separately prepared melts of steel and slag was described in detail in *THE IRON AGE*, Oct. 14, 1937, by R. Perrin. At that time a considerable amount of promising commercial production had been achieved in France. More recently the Tata Iron & Steel Co., Ltd., India, has carried out very extensive production runs using the Perrin technique, and the results obtained were described by B. Yaneske before the autumn meeting of the Iron and Steel Institute at Sheffield, England. This paper gave rise to considerable discussion, extracts of which are appended, by courtesy of the *Iron and Coal Trades Review*.

In the absence of Mr. Yaneske, a summary of the paper was given by Dr. T. Swinden, who commended it as the description of an excellent piece of work in such detail as to enable anyone interested in the subject to study it carefully and consider what advantage, if any, could be derived in his own circumstances from the work which had been carried out.

J. H. Whiteley said that the speed at which the reactions took place surprised him. For instance, within a minute the silicon could be reduced to 0.2 per cent and the phosphorous reduced from 0.25 to 0.05 percent. Those who used the open hearth method in steelworks had been accustomed to much slower rates of reaction. Another interesting point had reference to the ferric-oxide content of the slag. If one looked through the various charges given in the paper, it would be found that when a synthetic

slag was used there was a high ferric-oxide content and in every case the oxygen for the removal of phosphorous seemed to be supplied by the ferric oxide. The ferrous oxide increased and the ferric oxide decreased. There were three instances given in the paper of the use of slag taken from a duplex basic open hearth. There was much less ferric oxide in them and a higher silicon content, and, although the ferric oxide was reduced, the ferrous oxide was also reduced. In the case of the synthetic slags, however, the oxygen seemed to be supplied almost entirely by the ferric oxide, although it had only half as much more oxygen as the ferrous oxide. That brought to his mind a point that Dr. Hallimond and he had brought forward many years ago in a paper on acid openhearth slag. They came to the conclusion, as a result of their experiments, that in the acid open hearth slag the carbon was removed chiefly, if not entirely, by the small amount of ferric oxide that was continually being formed in the slag, and he was inclined to think that the experiments described by Mr. Yaneske rather supported that view.

## Scope of the Tests

R. Percival Smith said that the paper was an object lesson to members. In it the author described 100 casts made at the Tata company's works. That was to say, he was actually describing a gigantic experiment, in which 3000 tons of steel were produced by a private company. It was quite obvious that the author and his associates had not attempted to answer and could not answer in such a paper the

questions that must spring to the mind of every steelmaker, but at any rate the Tata company had made a wonderful effort to solve for its own purposes a problem in steel-making. If one private company could afford to do the work described therein, what could the steel trade, acting as a whole, do in the matter? Steel was not being made in a satisfactory way in the open hearth furnace; all steelmakers knew in their inmost hearts that the open hearth furnace was an extremely unsatisfactory tool with which to work. How could any steelmaker be proud of a tool that could not give him more than 20 per cent efficiency and with which he had to labor for hours in order to get what he wanted?

A. Robinson said that one very important point in the process was the matter of melting the slag. He would like to know whether a satisfactory furnace and a satisfactory lining for that furnace had been found, capable of standing up against the slag, because people engaged in the steel trade knew very well that the material that damaged their banks and linings was the slag itself. He would also like to know the temperature of the steel before and after treatment.

## Validity of the Theory

J. Mitchell, speaking as one who had been in contact with Mr. Perrin, said that so far as the paper was concerned, he thought it was a matter of extreme interest that the very careful way in which the work had been documented had shown quite clearly that Mr. Perrin's theoretical considerations were perfectly correct, and he him-

self would be very proud to find such excellent confirmation in large scale laboratory experiments of what he set out to do. The record of tests given in the paper would provide subject matter for all those people who were fond of discussing the effects of oxygen and the oxygen reaction, but, looking at the results given by the author, he thought it was perfectly clear that there were two things which could not be done satisfactorily in the steelmaking operation. One could not start with a high-phosphorous iron and take out the phosphorous in a hurry and hope to have what might be called a first-grade steel. It had been demonstrated once again in the paper that there must be a certain order and there must be a certain rate of removal. Mr. Whiteley had expressed surprise that the reactions took place so quickly, but, after all, nearly 2 per cent of phosphorous was taken out in a little less than two minutes in a bessemer converter.

He thought the moral of the paper was that, given the necessary intermixing with a suitable slag, one could do almost anything that one wanted to do in practical work.

A. G. Hock said he thought it should be realized that Mr. Perrin had done some later work on another subject and that the question of the temperature of the slag was very important indeed. He thought that in Mr. Perrin's later work temperatures up to 1700 deg. C. (3092 deg. F.) were used for the slag.

J. S. Gerber said that he had carried out some experiments with the Perrin process and had found that, by adding a certain amount of molten pig iron to the slag and then pouring the metal on to the slag, one obtained quite interesting results. The metal was deadened to a greater extent and there was less rimming effect. He also wondered whether pouring the metal out of a ladle from a height of 20 ft. could be avoided, and the metal be poured from a lower height from a bottom-pour ladle, and whether that would materially affect the process.

#### Experiments at Brown-Firth

W. H. Hatfield said that theoretically the Perrin process was most interesting, but, of course, everything turned on the application of such a process, and several matters came to his mind in that connection. He spoke from experience and with authority, because, like the Tata works, the Brown-

Firth works had carried out a long run on the Perrin process and made a number of casts of steel, but its object had not been the same as that of the Tata company. Its object had been not to dephosphorize, but to test another claim of Mr. Perrin's, *i.e.*, that, by giving an adequate suitable composition to the steel and by rapidly intermixing the metal and the slag, one might produce a cleaner steel. When experiments were carried out on a large scale, it was necessary to improvise; the Brown-Firth works had improvised quite successfully, and Mr. Perrin and his colleagues had been satisfied that a very reasonable attempt had been made to try out the process in question. The steel made by the process had been quite good. All the data had been given to Mr. Perrin, and he had on occasion given them to his friends in this country. When one came to deal with the question of making clean steel, the steel was already in the furnace in quite an advanced condition with regard to the reactions, and one had to judge whether to let it remain in the furnace and continue the reactions there or to adopt Mr. Perrin's somewhat revolutionary method of taking the steel out of the furnace, mixing it with slag, and so on. The outcome of the experiments made by the Brown-Firth works was not to condemn the Perrin process, but, on the other hand, not to adopt it. He did not wish that to be taken as a criticism of the Perrin process, because, if the Brown-Firth works had determined that their steel should be made by the Perrin process and had continued experimenting for months instead of weeks, no doubt they would have improved their application of the Perrin process. With regard to Mr. Percival Smith's suggestion that the industry as a whole should deal with the matter, he was sure that all the firms that had done work in that field were very glad to exchange their experience. Experiences were being exchanged on everything today.

The Perrin process (continued the speaker) brought home to those who had taken an interest in the open hearth process for a long time the fact that the reactions took place on the interface between the slag and the metal; it was simply the bottom of the slag reacting on the top of the metal all the time. If one could bring about a complete mixing of the two, one would expect a rapid action. As to how that

was to be done, one must have the slag at the proper temperature and one must arrange for the production of the slag at the proper position and at the proper temperature at the moment when the steel was ready to be mixed with it. That was not as easy as it appeared to be, and that led him to inquire as to the cost of the Perrin process. As he had said, a regularized process was disturbed by the somewhat revolutionary procedure suggested, which could not be introduced except at a cost, and he would like to know the cost. It would be very interesting to know, for instance, the cost of maintenance and the cost of running the slag furnace, so that one might see the influence on the economics of the process.

Another thought that came into his mind was that at any given moment in the open hearth furnace the composition of the slag was that which resulted from its history, whereas in the Perrin process one created for the moment, and he rather thought that an appreciation of the facts emphasized by Mr. Perrin would lead to a general material improvement in open hearth practice.

#### Effectiveness of Slag

D. Manterfield said that, in comparing the effectiveness of synthetic slag with basic open hearth slag, the author suggested that the increased efficiency of the synthetic slag was due solely to the higher acid content of the basic open hearth slag. He wondered whether it was not due also, perhaps to a greater extent, to the excess  $\text{Fe}_2\text{O}_3$  in the synthetic slag as compared with the basic open hearth slag. It was a curious fact, as Mr. Whiteley had said, that in almost every case the ferric-oxide content of the slag decreased and the ferrous-oxide content increased, but, comparing heat No. P8 with heat No. P15, which were essentially duplicate experiments, in one case the ferrous oxide content hardly increased at all while the ferric oxide content decreased slightly, while in the other case the ferric oxide content decreased and the ferrous oxide content increased in the same way as in the rest of the experiments, yet the dephosphorization in both heats was very similar. He wondered what was the explanation of that.

The president said he was sure the meeting would like to convey to the Tata company its apprecia-



tion of the liberty given to Mr. Yaneske to put before it the results of the wonderful investigations and experiments which had been carried out. He thought it was highly commendable that the company had made that information available to people in this country who were interested in the subject. He had followed the Perrin process with interest for some time. It seemed to him that the world was wanting better steel and at the same time

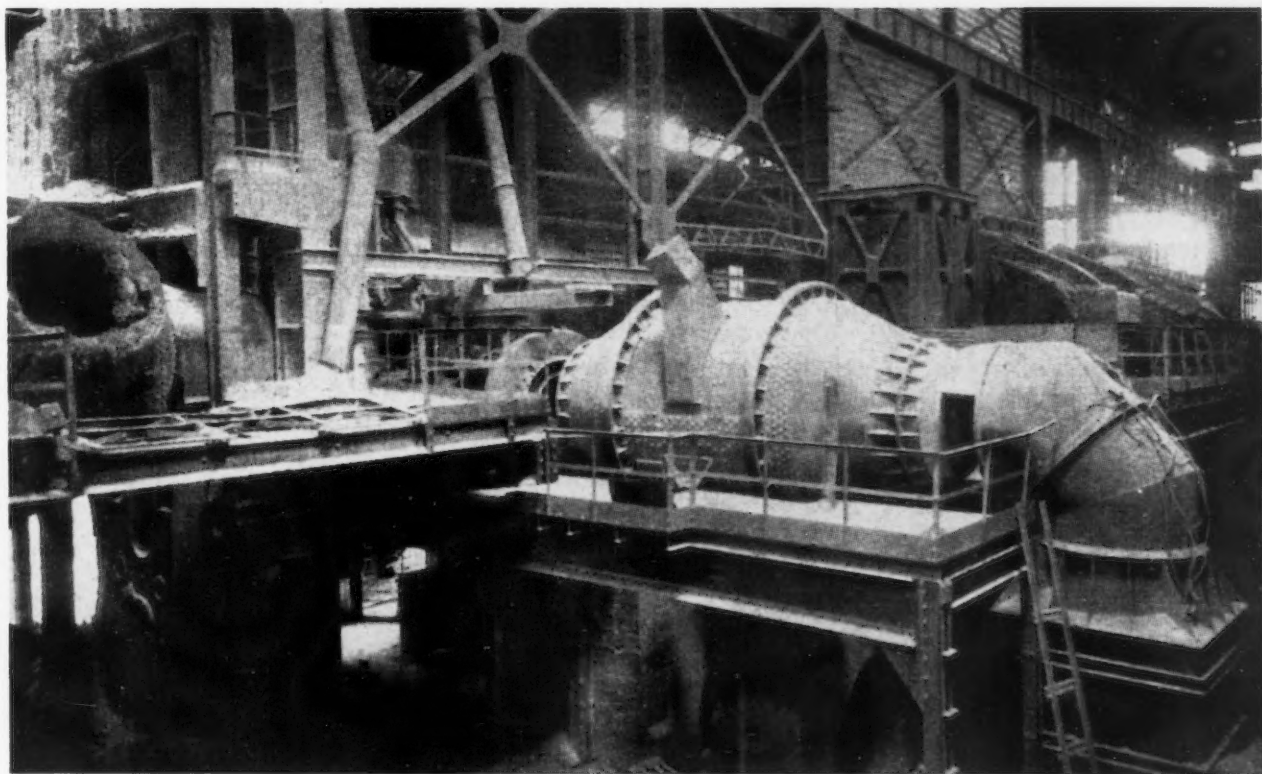
pure ores could be used to make high-grade steel.

#### Reply by Dr. Swinden

Dr. T. Swinden said that the author would reply fully to the discussion, but he would like to make some observations on the contributions which had been made. With regard to Mr. Whiteley's reference to the nitrogen content of the steel made by the Perrin process, it would be very interesting and use-

treatment, in the case of a low carbon heat the nitrogen content would probably remain fairly high, but in some of the cases in which a higher carbon content had been used and fairly violent agitation took place he would expect the nitrogen content to be somewhat reduced.

As to the slag treatment of blast-furnace material before Bessemerising, the obvious difficulty was the high silicon content, which would react with the slag and re-



The rotating oil-fired slag furnace used at Valenciennes, France, in the application of the Perrin process for rapidly refining steel. At the outlet of the furnace, combustion gases go through a metallic recuperator, thus allowing a re-heating of incoming air up to a temperature of about 1290 deg. F.

the supply of good natural ores was becoming exhausted, and it seemed as if by his process Perrin was going to overcome the shortage by making available for the production of very high-grade steel the secondary ores of the world. While Mr. Perrin had not yet perfected his process, the paper opened an avenue for discussion and thought which some of the younger members of the steel industry might follow, and, by improving the Perrin process, they might make up for the world's shortage of very good hematite ores, by showing how very high phosphorus ores and im-

ful to have figures supplied in that connection. In his own experience with acid-bessemer steel, the nitrogen content was normally of the order of 0.015, and he had found that that was not reduced unless the material was subjected to an appreciable agitation by way of boiling. For instance, the nitrogen content in the open hearth could be reduced if the material was given a vigorous boil. On the other hand, if the material was melted and not agitated in that way the nitrogen content was not reduced. It would therefore appear that, with the slag

duce both its basicity and its oxidizing power. But, bearing on the point to which Mr. Whiteley had referred in his second contribution to the discussion, *i.e.*, the treatment of 1.5 per cent phosphorus material, he had intended to imply that it was precisely in that direction that experiments were being made in this country at the present time.

Percival Smith had emphasized the important commercial point which had also been referred to by Dr. Hatfield, namely, that the plant in question had been built for a specific purpose. He did not think

that he was betraying any confidence in saying that Mr. Mather had explained the position to him as being that the Tata company had planned to extend its production and that the Perrin process had been regarded as a possible alternative method. The results of experiments had been such as to make the company decide to work in the way described in a works planned essentially for the process.

On the same point he would take Dr. Hatfield's question about cost. He could not quote the actual figures which had been given to him, but clearly the company anticipated a reduced cost of production as compared with that of its normal duplexing process; otherwise it would not have adopted the Perrin process. The anticipated saving was at least several shillings per ton, and on the scale of production of the Tata works that would represent a large amount of money.

As to efforts being made on a co-operative scale, he was sure all the members sympathized with Percival Smith in his appeal, and agreed that a problem of the kind in question merited a large-scale attack, and, notwithstanding the great efforts that had been made, largely by Dr. Hatfield through the Research Council, he felt that there was room for such an attack. Percival Smith, as chairman of the Openhearth Committee, was perhaps in the best position to press for more large-scale cooperative research work to be carried out into

production processes. The furnace for slag melting certainly constituted a problem. The author said in his paper: "In order to conduct these experiments, one of the 250-ton basic openhearth tilting furnaces at the duplex plant was employed for melting the synthetic dephosphorizing slag whenever suitable opportunities occurred." The lining would be magnesite. In the new plant there were two slag-melting tilting furnaces, each of 507 tons slag capacity, openhearth design, basic-lined, heated with mixed gases.

Mr. Hock had referred to the high temperature of the slag which he and others saw on their recent visit, but that, of course, was deoxidizing slag, in which one relied on a reduction of silica. It was very probable that in the case of dephosphorizing a lower temperature would be desirable, in that the phosphorus was more readily removed at a lower temperature than at a high temperature, but no doubt Mr. Yaneske would give details of that.

He entirely agreed with Mr. Mitchell's commendation of Mr. Perrin's lucidity of thinking and the very clever way in which he had carried out his experimental work. He was sure that everyone who had seen what Mr. Perrin called his cocktail shaker, in which he carried out his original work, pouring metal into one ladle and slag into the other, mixing them and analyzing at intervals, and so forth, had been really impressed by the plan-

ning of the experiments and the way in which they were carried out.

Dr. Hatfield's remarks, as he had himself said, referred essentially to a different type of Perrin process, *i.e.*, the deoxidizing process. Those who saw that process tried out had been very much impressed by it. They saw 15 tons of metal put into such a highly oxidized state that it would have taken at least half an hour, possibly an hour, to get the bath back into condition in the ordinary way, but they saw the furnace tapped almost immediately and 31 ingots cast in the usual way, and they had the first, the middle and the last ingot of an alloy steel which were very good ingots indeed, very clean and made of really first-class steel. But, having seen all that and having been to a great deal of trouble in consultation with Mr. Perrin and his advisers, he agreed with Dr. Hatfield that it was difficult to visualize the fullest and most proper application of the process in the absence of a plant designed to do the work on a commercial scale.

It seemed quite evident from the paper that it was the  $\text{Fe}_2\text{O}_3$  which supplied the bulk of the oxygen, and the fact that a larger proportion of the open hearth slag was required than of the synthetic slag undoubtedly hinged to a certain extent on the amount of silica present, the acid oxide, of course, rendering the slag less basic and therefore reducing the availability of base removal of the phosphorus.

## Worn Parts Reconditioned By Stainless Spraying

**S**PRAYING worn locomotive parts with 18-8 stainless steel by a metallizing process and re-machining to size is producing reconditioned parts giving from 100 to 300 per cent their original service life on a Middle Western railroad. Prior to the metallizing, all surfaces to be sprayed are sand blasted, using a 30 mesh steel angu-

lar grit, which not only thoroughly cleans but also roughens the surface and enables the sprayed metal to adhere to it. Spraying is to a depth of 1/64 to 1/32 in. per side in excess of the size to which the part is to be machined.

To obtain the fine finish desired, it was found desirable to turn such sprayed metal finishes at high speeds—from 200 to 450 ft. per

min.—with fine cuts and a slow feed, using Carboloy tools. In re-machining an air and water pump rod in a lathe, for example, cutting speed was 242 ft. per min., with a 1/64 in. depth of cut and 0.005 in. feed. Floor to floor time for this 2 ft. long 1 3/4 in. diameter shaft was 20 min., with approximately 12 pieces machined per grind of the carbide tool.



# Germans Active in U. S. Patent Office

**I**N the ten years covered by the period 1930-1939, the total number of patents issued by the United States Patent Office (excluding reissues, design patents, trade marks, and the like) was 442,989. Of these, 63,482, or about 14 per cent (1/7) were issued to residents of foreign countries. Among these foreign states, and in descending order as to the number of patents issued to their citizens, are Germany, Great Britain, France, Canada, Switzerland, Sweden, Netherlands, Italy, Austria, Australia, Japan, Belgium, Czechoslovakia, Denmark, Norway and Poland—with many others not here enumerated.

Of this total of 63,482 patents issued to residents of foreign countries, patentees of German nationality have averaged about 37 per cent—this being approximately twice as many as those applying from Great Britain, almost four times as many as from France, five times as many as from Canada, eight times as many as from Switzerland, and so on.

During the first half of this ten-year period, of the 243,697 patents issued, 12,632 were issued to residents of Germany. During the second half of this ten-year period, out of 199,292 patents issued, 11,055 were issued to residents of Germany, showing a drop of approximately 12 per cent during the five-year period ending in 1939.

On the whole, more patents were issued during the years 1930-1934 to residents of both the United States and foreign states than during the second period of 1935-1939. This was to have been expected, since the depression was world-

By **GEORGE D. HARTLEY**  
*Consultant, Worcester, Mass.*

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wide, and patents normally take from two to three years, or more, to progress through the Patent Office to issuance. Practically every country showed the effect of the depression in a lessened output of inventions.

But it is worthy of note—and this is the chief point of this statistical relation—that while the total number of patents issued to residents of Germany as against the total number issued by the United States Patent Office shows a percentage of 5.16 per cent during the five years 1930-1934, the figures for the second period from the end of 1934 to the end of 1939 shows an increase in this percentage to 5.54 per cent. Thus, although during the second five-year period a smaller number of patents was issued in the United States Patent Office, and a smaller number of United States Patents was issued to residents of Germany than during the first five-year period, yet the number of patents issued to German residents has increased more than 7 per cent during the 1935-1939 period, showing a decided increase in activity.

Of the patents issued to residents of Germany, the following may be taken as a fair analysis:

- (1.) Die stuffs and chemicals—28 per cent.
- (2.) Cathodes, electronics, wireless, radio, television, telephony—22 per cent.

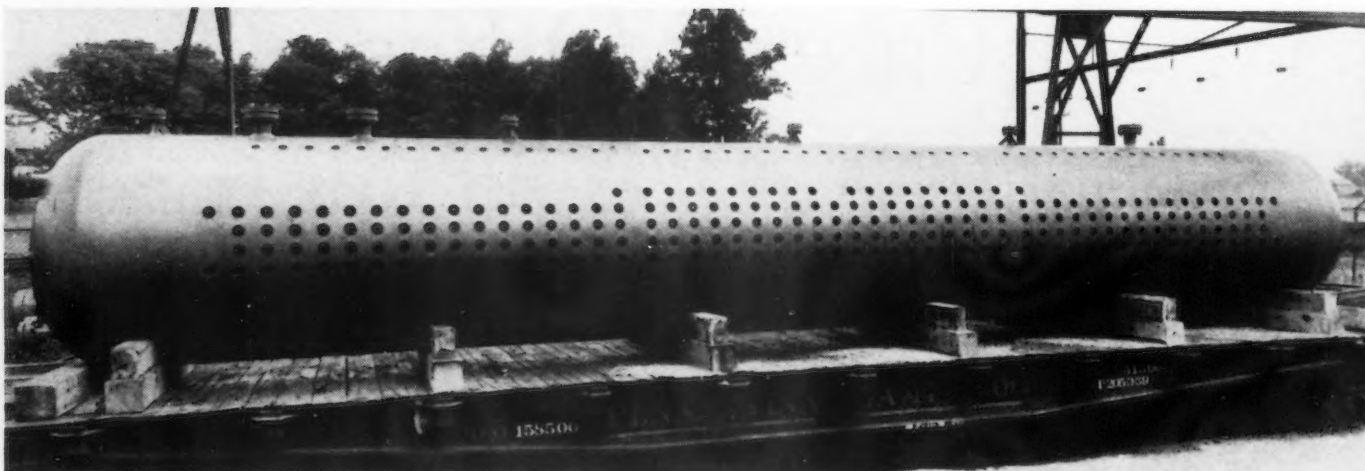
- (3.) Mechanical—12½ per cent.
- (4.) Optics, photography (including motion pictures)—11 per cent.
- (5.) Textiles—5 per cent.
- (6.) Electrical equipment and accessories—5 per cent.
- (7.) Aviation and military—3 cent.
- (8.) Motor vehicles — 2½ per cent.
- (9.) Metallurgy—2 per cent.
- (10.) Miscellaneous—9 per cent.

(This subdivision was obtained by taking at random, at intervals of a few months, a number of issues of the Patent Gazette during the past two years, and classifying the inventions).

On the whole, the number of inventions per year coming from the different industrial countries of the world to the United States Patent Office holds very steadily over the last ten-year period. This is referring to such countries as Great Britain, Canada, France, Switzerland, Sweden, Italy, Belgium, etc. It should be noted that up to 1939 Austria, Czechoslovakia, and Poland are listed by the Patent Office as separate countries, and are not included in Germany. As an item of humor, it might be noted here that the Patent Office includes Scotland and Wales and Nova Scotia as separate countries. "Ireland" and the "Irish Free State" follow each other in the same classification in the same years, with an occasional appearance of Northern Ireland. The Island of Jersey, the Isle of Man, the Channel Islands and the Shetland Islands are also given, each of them, status as separate countries.

By Dr. W. G. THEISINGER  
Welding and Metallurgical Engineer,  
Lukens Steel Co., Coatesville, Pa.

# Welding 70,000



SINCE 1933 when the American Society for Testing Materials adopted high tensile strength carbon-silicon steel plates for boilers and other pressure vessels under the classification ASTM and A-149 and A-150 (recently combined as A-212) and the American Society of Mechanical Engineers' boiler code committee approved it about a year later under the classifications ASME S-26 and S-27 (now combined as S-55) the use of this material has increased steadily. The physical requirements for this steel (Grade B) are:

Tensile strength	70,000 to 82,000 p.s.i.
Yield Point	0.5 tensile strength
Elongation in 8 in., minimum	Flange 1,550,000 tens. str.
	Firebox 1,600,000 tens. str.

The essential difference between the specifications ASTM A-149 and A-150 was in the thickness of the steel: A-149 included plates up to and including 2 in. gage, and A-150 covered gages over 2 in. The comparable ASME S-26 and S-27 specifications were of the same order. The physical properties for all grades were and still are the same, and are usually referred to as 70,000 lb. per sq. in. minimum tensile strength steel. The combination under ASTM A-212 and ASME S-55 now eliminates these thickness ranges.

Welded boiler drum fabricated from Lukens 70,000-lb. tensile steel by the Badenhause division of the Riley Stoker Corp. The drum is 60 in. inside diameter and the length of the 3 29/32-in. thick steel, exclusive of the heads, is 38 ft. Overall length is 42 ft. The drum as shown weighs 60 tons. It is to operate at 900 lb. working pressure.

The primary reason for the existence of this steel is the reduction in weight of the pressure equipment for equivalent operating pressures, as compared with vessels made of mild steel plate. Naturally there is less shipping

and handling weight in both the raw material and finished product. The 70,000 lb. tensile steel has been welded by most of the boiler and pressure vessel fabricators, and in a number of shops makes up the largest percentage of their regular production. However, it is not a foolproof metal that can be rolled, welded, etc., by everyone under any sort of conditions; but it is true that this high tensile steel has assumed regular shop routine with very little or no trouble where definite procedures have been established and enforced.

The vast majority of the vessels constructed of this steel are built in accordance with paragraph U-68 of the ASME Boiler Code covering welding of unfired pressure vessels and requiring X-raying and stress relieving. This X-ray inspection indicates the weldability of the steel in a very practical way. There is nothing in its chemistry or physical structure that lessens its response to the arc or causes a disturbance of the molten metal in the crater. Therefore the ordinary rules for good welding are sufficient to insure the usual freedom from the common defects in the weld.

The shop's main consideration in the welding of 70,000 steel is the attainment of the required physical properties of the deposited metal.

Relation Between Physical Properties of Parent Metal and Weld in High Tensile Strength Carbon-Silicon-Steel Plates and (Specification ASME S-55 or ASTM A-212)

2½ in. Plate material (Stress relieved)						
Tensile	Yield Pt.	Elong. in 8 in.				
77,600 p.s.i.	46,900 p.s.i.	28%				
0.505 All weld metal (Stress relieved)						
Tensile	Yield Pt.	Elong. in 2 in.	Red. of Area			
76,780 p.s.i.	61,250 p.s.i.	30%	62.3%			
Reduced section (Stress relieved)						
Tensile	Yield	Fracture				
76,780 p.s.i.	46,000 p.s.i.	Edge of weld				
Chemical Analysis						
	Per cent					
	C	Mn	P	S	Si	Mo
Plate	0.27	0.72	0.016	0.024	0.23	...
Weld	0.09	0.51	0.021	0.017	0.19	0.57



# Tensile Steel

There are available a number of suitable welding electrodes made for this type of steel and they have been used regularly with success. The welding rod manufacturer has applied metallurgical research to the development of his electrodes and has employed a number of combinations of elements to produce the desired physical properties. The accompanying table shows the results obtained with one type of rod. Other electrodes attain like values with the same or closely allied chemistry.

The table illustrates the uniform tensile and ductility properties across the joint attained through the adoption of a balanced chemistry in both the plate metal and the weld. There is a tendency at times, more especially at the beginning of the use of this high tensile steel, to select an electrode so as to produce a tensile strength in the weld metal that will be on the high side of the range in order that any irregularity which might lower this property, will not drop it below the 70,000 p. s. i. minimum. When tensile strength is to be attained at the sacrifice of ductility this practice is not to be recommended. In normal metallurgical processes, an increase in tensile strength is accompanied by a loss in ductility. To the fabricator, ductility of the weld metal is not as important in the completed and stress relieved drum as it is in the weld itself while the joint is being made. It is at this period that the ductile weld metal will withstand the cooling strains much better than the harder and less ductile weld of higher tensile strength.

A consideration of the problem of tensile strength should recognize the fact that whatever may be the effect of any unusual practice upon the ordinary type of steel in the lower tensile ranges, the same practices will have a greater effect on this 70,000 steel. For example, porosity, lack of fusion, prolonged stress relieving, etc., might normally reduce the tensile strength of the weld, let

us say, by 10 per cent. This would mean a loss of 5500 p. s. i. on 55,000 steel, but the same percentage of loss would reach 7000 p. s. i. on 70,000 steel. For this reason, greater care and a more rigid adherence to the principles of good welding technique must be followed.

In the actual welding procedure, there is one additional precaution that is not only helpful, but practically essential: Some heat should be introduced into the formed shell prior to welding and maintained until the completion of the joint, especially in unheated shops in the winter months. There is no agreement as to a definite temperature for welding, although anything under 60 deg. F., is dangerous. A temperature from 100 to 400 deg. F., depending on the shell thickness, is usually employed.

Warming the shell reduces the hardening in the base metal adjacent to the weld and materially eliminates any tendency to cracking in the weld metal by diminishing the severity of the temperature gradient, and hence the subsequent shrinkage. Once the shop management has selected the types of rods best suited to its needs and trained the operators in the technique desired, the greatest single factor for successful welding is preheating. The usual preheating

**S**OME of the special problems encountered in welding of high tensile plate steel covered by the new specifications ASTM A-212 and ASME S-55 are discussed by the author. The vast majority of vessels constructed of this steel are built in accordance with paragraph U-68 of the ASME Boiler Code.

temperature range is from 200 to 300 deg. F., and is accomplished by using an oil or gas flame inserted at one end of the shell. Light weight, circular shaped plates close each end with a trough-like attachment extending under the test plates. When the heads are finally put on they of course act to retain the heat.

Since most shops employ the conventional U-type joint, the greatest amount of welding is done on the outside of the shell and the preheating is discontinued when the chippers and welders are working on the inside. The small portion of the joint to be completed on the underside of the U-bevel may be done with the shell at shop temperatures comfortable to the welder. The double V-bevel does not lend itself so readily to this same treatment as there is practically an equal quantity of weld metal on each side of the joint.

The thicker the plate, the higher should be the preheating temperature. On thick plate of 55,000 to 65,000 p. s. i. tensile strength steel

(CONTINUED ON PAGE 71)

A 54-in. inside diameter welded cross drum boiler fabricated according to paragraph U-68 of ASME Boiler Code by the E. Keeler Co. of Williamsport, Pa., using 70,000 tensile steel. The shell plate is 13/16 in. thick and the overall length of the drum is 13 ft. 10 in.



# Metal Finishing

## —Recent developments in the electroplating of nickel, copper, zinc, silver, and alloys

By ADOLPH BREGMAN

Consulting Engineer, New York

A VALUABLE contribution to the practice of nickel plating was made by Wesley<sup>28</sup>, showing how mechanically sound nickel with excellent physical properties could be built up to substantial thicknesses by electrodeposition, and consequently used for building up worn parts, mis-machined pieces, etc., retaining the physical properties of the part itself.

Another important contribution of the last year was the work of Wesley and Carey<sup>29</sup>, describing the deposition of nickel from a nickel chloride-boric acid solution. Nickel deposited from a nickel chloride-boric acid solution is finer-grained, smoother, harder, stronger and somewhat less ductile than soft deposits from the ordinary sulphate electrolyte. Tested in the as-plated condition, coatings from the two baths are of about equal protective value when of equal thicknesses. The results of laboratory tests indicate that the advantages which can be obtained by electroplating from the chloride solution instead of from the sulphate bath include: a 50 per cent reduction in tank

voltage and power consumption; ease of control due to simple composition; wide plating range; high anode and cathode efficiencies; lower susceptibility to pitting; smoother, tougher deposits; less tendency to form nodular growths and trees on thick deposits; coatings are easier to buff. The principal disadvantage of the chloride bath is the greater corrosiveness of the solution.

An important contribution to the solution of the problem of depositing adherent nickel and chromium plates on tin plate was made by Hothersall and Leadbeater<sup>31</sup>.

Wetting agents are now widely used to minimize pitting in nickel solutions.

Interest continues at a steadily higher level in bright nickel plating which is now standard practice throughout the industry. Hothersall and Gardam<sup>32</sup> investigated nickel-cobalt alloy deposits; also plates from baths containing naphthalene sulphonate and from baths containing sodium isopropyl naphthalene sulphonate. They concluded that ordinary nickel plate is without lus-

ter because of the irregularity of its surface. No definite microstructure is visible in bright deposits and their porosity is about the same as matte nickel.

One of the moot questions in the electroplating industry is that of the comparative value of the various bright nickel plating processes available at this time. A recent study of this situation is interesting<sup>30</sup>. In general, the bright nickel plating solutions consist of the Watts type bath with the addition of one or more complex organic addition agents, which have the effect of reducing the size of the crystals in the deposited metal. The one exception is the cobalt-nickel deposit, which also has an organic addition agent, but which differs from the other mainly in the composition of the deposit, and the use of an anode which contains a substantial percentage of cobalt. Another cobalt-plating solution has appeared which gives ductile, "semi-bright" deposits, using a low cobalt content anode.

### Copper

The use of the Rochelle salt-copper cyanide solution is now standard practice in the industry. The effects of Rochelle salts, sodium carbonate, sodium cyanide and metal concentration upon copper solutions have been investigated by Graham and Read<sup>37</sup>, and Wagner and Beckwith<sup>38</sup>. According to Young and Reid<sup>39</sup>, concentrated copper

**T**WENTY-FOURTH in a Series of Articles on  
the Technical and Economic Aspects of Metal  
Cleaning and Finishing



cyanide plating baths permit higher current densities than the dilute baths.

Metallic impurities in cyanide copper baths have important effects upon the deposit, being co-deposited with the copper and causing brighter deposits in some instances, according to Meyer and Phillips<sup>40</sup>.

A bright copper plating solution has been developed by Louis Weisberg and Lawrence Greenspan, covered by U. S. Patent No. 2,195,454.

temperature the diffusion of copper into the zinc base alloy is greatly promoted. An important factor in this type of work is to clean in the mildest possible alkali which will leave the surface of the casting virtually unchanged, especially on the buffed areas. If the casting is properly cleaned, it may be heated in excess of 100 hr. at 300 deg. to 350 deg., after which time virtually all of the copper has diffused into the base metal with-

other interesting innovation in zinc plating is the use of zinc anodes containing 0.18 per cent magnesium which tends to reduce the anode efficiency to the level of the cathode efficiency, thus preventing the usual build-up of metal concentration in the solution.<sup>42</sup> (See Fig. 4).

The use of bright zinc plating has continued to expand, due, no doubt, in part, to the high price of cadmium.

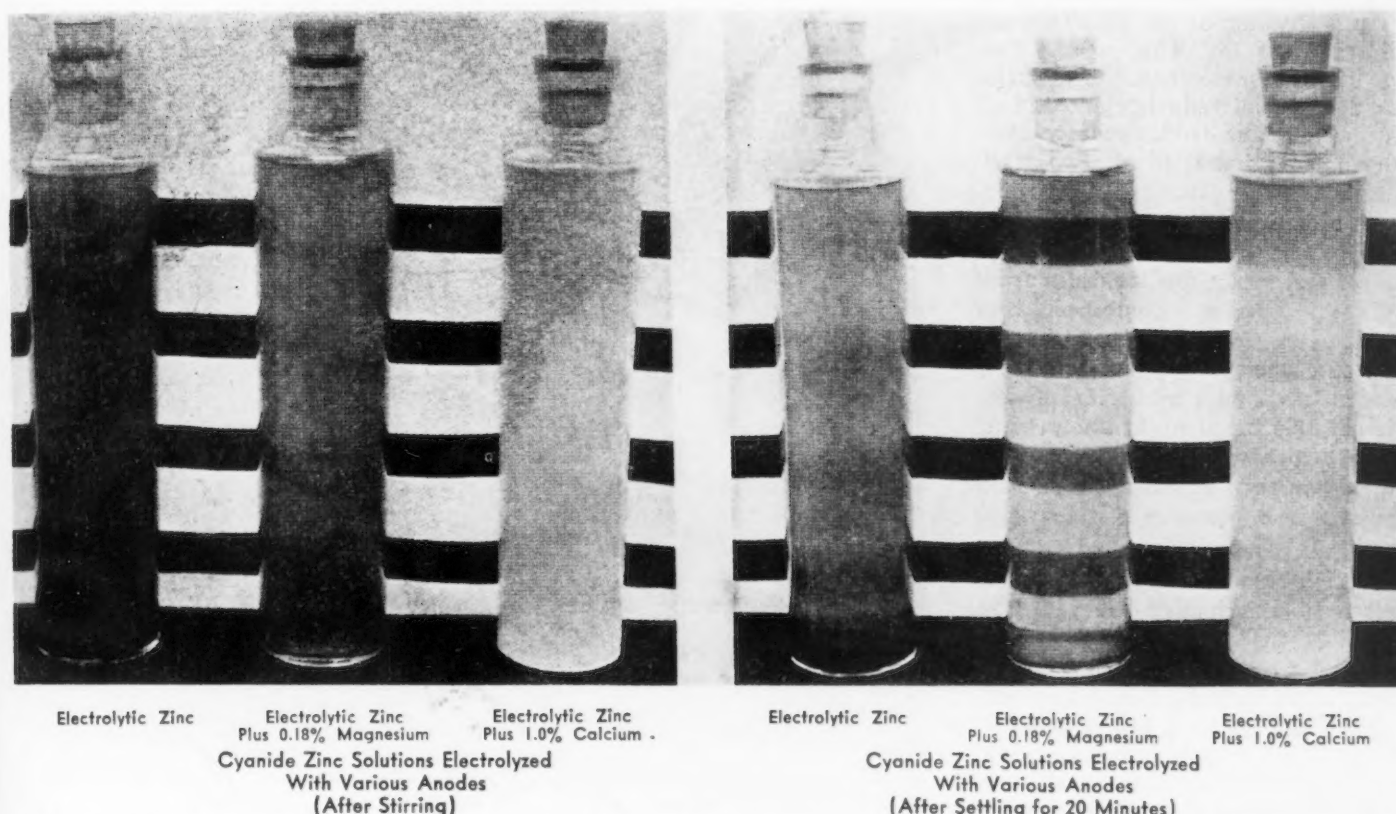


Fig. 4—The effect of magnesium in reducing sludge formation in cyanide zinc solution. Note, at the right, how much clearer the solution is which was worked with the anode containing 0.18 per cent Mg. Courtesy American Electroplaters' Society.

The copper is present in the form of a complex salt formed by interaction of copper sulphate with a suitable amine. Addition agents are used as brighteners. Copper plating at high speed is facilitated by the Du Pont process by which coatings of from 0.001 in. to 0.003 in. can be obtained in from 10 to 20 min., providing an excellent surface for direct deposition of bright or dull nickel.

The diffusion of copper plate into zinc base die casting has become an increasingly important problem, since the advent of baked organic finishes on die castings, which subject the work to temperatures up to 325 deg. or 350 deg. F., at which

out blistering the superimposed coating. With proper cleaning, no diffusion should take place under 250 deg.

#### Zinc

The important development in the steel industry, the deposition of heavy ductile zinc coatings on steel continues to hold the interest of this industry. Electrogalvanized wire is, of course, by now an established product, but several pilot plants are now in operation for electrogalvanizing strip steel.

An improvement in bright zinc plating is the addition of small quantities of molybdenum to the bath in the form of  $\text{MoO}_3$  together with organic addition agents.<sup>41</sup> An-

#### Silver Plating

Silver continues to be the object of a considerable amount of attention, including such features as the use of thiosulphate for cyanide, bright silver plating and silver plating for industrial applications. Mathers and Gilbertson<sup>43</sup> found that the porosity of electroplated silver is dependent upon the thickness of the plate, the roughness of the base metal and the method of application. However, Dornblatt, Lowe and Simon<sup>44</sup> were able to deposit pore-free coatings of silver 0.0001 in. thick on specially prepared steel plated with 0.0005 in. of copper.

According to Wood<sup>45</sup>, sodium cy-

anide solutions with 16 oz. per gal. of potassium nitrate are superior to potassium cyanide solutions for silver. Egeberg and Promisel<sup>46</sup> recommend thiourea and some dithiocarbonates for silver brighteners. The co deposition of various metals with silver such as nickel, cobalt, cadmium and copper, has been undertaken by Johnson and Mathers<sup>47</sup>; alloys of iron with silver, by Fink and De Marchi<sup>48</sup>.

A process of mirror manufacture has been reported by the Peacock Laboratories, Inc., Philadelphia, Pa., a division of the Libby-Owens-Ford Glass Co. This process uses a silver ammonionitrate solution and a special reducing agent, both of which flow from separate overhead containers to a two-nozzle spray gun, in which the solutions are atomized by compressed air in such fashion that the two sprays meet and mix a few inches in front of the nozzles. Combined, they reach the glass and deposit a pure silver coating at the rate of 12 sq. ft. in less than 1 min. The process is suitable for straight line production, which with the proper equipment can turn out as much as 8000 sq. ft. of mirror per day.

Silver plating for industrial purposes has achieved a prominent place in the industrial eye.<sup>49</sup> The work of the American Silver Producers' research project at the Bureau of Standards, has shown that silver may be used as a protective lining for industrial containers, and that cans having a copper coating of 0.001 in. followed by 0.0001 in. of silver can be made pore-free. The silver can be deposited at 200 amp. per sq. ft. at which 0.0003 in. thickness may be deposited in 1 min. Pore-free deposits of either silver or copper 0.001 in. thick are readily obtainable on all suitable basis metals. Undercoats of either copper or nickel 0.001 in. thick are suitable foundations for the thin pore-free silver deposits. Deep drawing steel, electroplated with ductile deposits of copper, nickel or silver, or combinations of these three, can be subjected to press forming without perforating initially pore-free deposits, providing the deposits are at least 0.002 in. thick. (See Fig. 5.)

Electrodeposition seems to be a promising means of preparing silver-lead alloys for bearings.<sup>50</sup> Alloys containing 3 to 5 per cent lead

have been plated to a thickness of 0.001 in. with no visible segregation of lead.

#### Plating of Alloys

Another important field for electroplating lies in the deposition of alloys, in which the industry has a bright future. Brass plating is an old art, at one time considered very difficult and troublesome, but today, standard practice. Bright cobalt-nickel plates are now commonly

Erskine.<sup>55</sup> Varied iridescent colors are said to be obtainable from molybdenum sesqui-oxide solutions, by Krause.<sup>56</sup>

Metal coloring has extended its borders to include coloring stainless steel, including the Bach process<sup>57</sup> and U. S. patent No. 2,172,353, issued to C. Batcheller, assignor to Allegheny-Ludlum Steel Corp., for coloring stainless steel by immersion in the solution containing sulphuric acid and an oxidizing agent

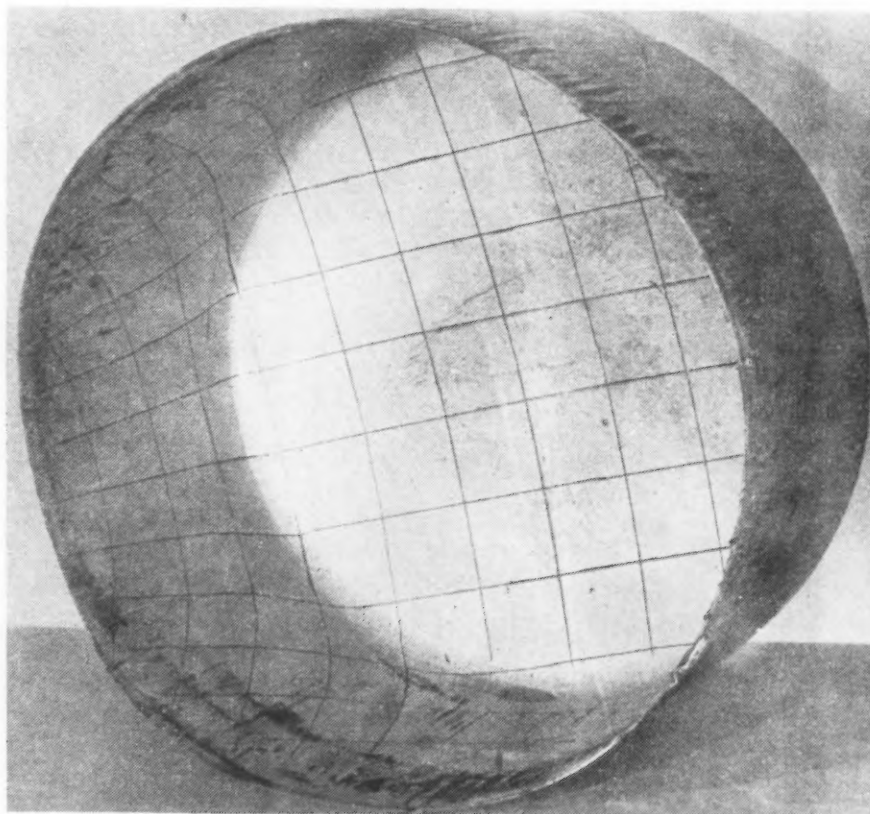


Fig. 5—Flat silver plated steel sheet (0.05 in.) which was cross-sectioned and deep drawn. Courtesy American Electroplaters' Society.

produced. It is predicted that many more alloys will soon join this small group—alloys of nickel, iron, copper, etc.<sup>51</sup> The plating of "white brass" (copper-zinc) has been described by Oplinger.<sup>52</sup> The deposition of copper-nickel-zinc alloys was described by Faust and Montillon.<sup>53</sup>

An outstanding contribution was made by L. C. Pan<sup>54</sup> on the subject of ammonia in brass plating solutions.

#### Metal Coloring

Important advances have been made in metal coloring. Cadmium deposits have been colored in oxidizing solutions, according to

and an etching inhibitor, to produce a deep, adherent black.

A useful development is the invention of a new black molybdenum finish<sup>58</sup> consisting of about 45 per cent molybdenum, 10 per cent nickel and the balance chiefly oxygen, on zinc or cadmium surfaces, which seems to be markedly superior to black nickel plating and similar black coating processes.

Steady growth has been enjoyed by the process of color plating, giving any color and also special dappled effects, by direct electroplating, developed by United Chromium, Inc.

Metal coloring should broaden in use along the lines of oxide coat-



ings which are more stable than the presently used sulphides.

### Rust Resistant Finishes

A recent improvement in black finishes on steel is a two-dip immersion process for forming a black oxide. This finish is highly decorative but it also provides an excellent base for paints, lacquers and enamels, promoting adhesion and rust resistance.

An important function of metal

and here also the degree of protection varies with the thickness of the deposit of zinc, either hot dipped, sprayed or electrodeposited.

A summary of the problem of protecting steel against corrosion appeared in *THE IRON AGE*, Feb. 15, 1940, written by J. C. Hudson.

A development of note is the Corronizing process of the Standard Steel Spring Co., in which nickel is plated over a zinc or cadmium plate on steel, and then subjected to

with the cooperation of the American Society for Testing Materials. The most recent testing program involved the exposure of coatings of copper, nickel or chromium, or combination of these metals plated upon steel, copper, brass, zinc and zinc base die castings in six locations.<sup>51</sup>

The most important factor in the protective value of nickel-chromium coatings on steel, brass or zinc, was the thickness of the nickel coating. A layer of copper under the nickel added little to the protective value of thin coatings. With thick deposits, the protective value of the composite coating approached, but did not exceed, that of a nickel coating of the same thickness. Variations in the basis metal, variations in the method of nickel plating and variations in the thickness of the chromium coating from 0.00001 in. to 0.00003 in. had very little effect. Chromium over 0.00005 in. is likely to cause cracking, especially over nickel coatings on brass. Variations between basis metals of any group had no great effect.

A greater degree of thickness of nickel was required to furnish a good degree of protection on zinc than on brass, and a greater thickness of nickel was required on steel than on zinc.

Along these lines interesting suggestions for specifications were made by A. W. Hotherhall,<sup>52</sup> which were not far from the present Tentative Specifications of the A.S.T.M.<sup>53</sup> Valuable work on specifications for plated coatings on zinc has also been done by the New Jersey Zinc Co.

One of the most important adjuncts of plating practice is the testing of deposits for thickness, in which important progress has been made in magnetic testing. The outstanding advantages of this method are the ease and speed of determinations and the fact that it is non-destructive.

Another useful method is the B.N.F. jet test, developed by S. G. Clarke,<sup>54</sup> in which a jet of reagent suitable for the particular coating is delivered at a constant velocity onto the desired spot of the surface of a plated article. The liquid "bores" through the coating at a constant rate at the temperature of testing. The thickness is obtained by a simple proportion from the time required for perforation. With composite coatings, the time for

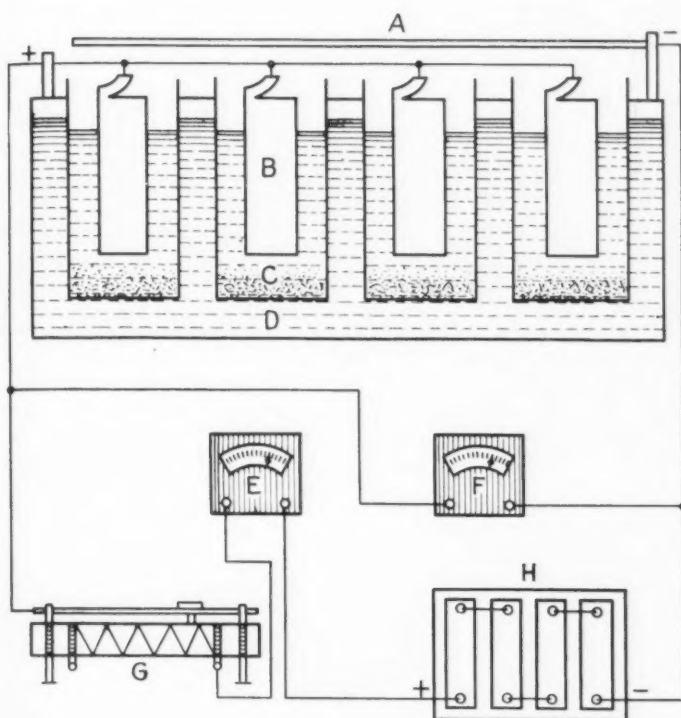


Fig. 6 — Wiring diagram for treating copper in a solution of beryllium sulphate to prevent tarnishing. A, cathode bar; B, lead-tin alloy anodes; C, colloidal plating solutions; D, temperature control tank; E, milliammeter; F, voltmeter; G, slide-wire resistor; H, Edison cell. Courtesy American Electroplaters' Society.

coating is the protection of steel structures against corrosion in service, which is generally done by the use of paints. Through the much better understanding of corrosion gained in recent years, it is now known that all material should be thoroughly descaled before the application of the first priming coat. The descaling can be carried out by sand or shot-blasting, or when practicable by pickling. An important step here is following the pickle by application of a phosphate coating which acts as a rust inhibitor as well as a priming coat. Flame descaling is becoming increasingly popular.<sup>55</sup>

In general, low alloy steels are better behaved under weathering than the ordinary steels. The average life of paint on ordinary steel has been given as about 2.8 years, while on copper-chromium steel, it has existed 4 years.

Zinc is, of course, the universally known protector against corrosion, especially under alkaline conditions,

a suitable heat treatment. The result, it has been stated, is high resistance to corrosion and a highly protective base for subsequent coats of paint or other non-metallic protective and decorative coatings.

Interesting progress is being made in the protection of metal surfaces from tarnish by the deposition of a beryllium oxide film.<sup>56</sup> A tarnish resisting film has been deposited on copper, about 0.000004 in. thick, which will withstand rubbing with non-abrasives, although it is weak against mechanical abrasion. (See Fig. 6.)

### Specifications and Testing

Specifications continue rightly to be the subject of constant thought. It will be generally agreed that the most important work done in the past few years on the value of electroplated coatings for protection against corrosion has been carried on at the National Bureau of Standards under the auspices of the American Electroplaters' Society,

perforation of each layer is determined and the thickness of each is worked out separately.

Among the tests for porosity of electroplated coatings may be listed the ferroxyl test, the hot water test, the iodine test and the salt spray test.<sup>65</sup> For nickel and chromium coatings on iron or steel the modified ferroxyl test gives results consistent with the thickness of the coating and the behavior on outdoor exposure. The salt water test is less sensitive and the iodine test is less satisfactory than the modified ferroxyl test, and less consistent.

For nickel and chromium coatings on copper or brass, no sensitive porosity test is yet available except on very thin coatings. For nickel and chromium coatings on zinc and zinc base die castings, the salt spray is the best available, but is also not very sensitive.

Dropping tests are widely used for measuring the thickness of zinc and cadmium coatings on steel. Of course, the most accurate method, although the slowest, is microscopic measurement.

In applying the spot test to chromium plating, an important element has been found to be the standardization of conditions, including temperature and the concentration of hydrochloric acid used. Consequently, changes have been recommended in the Tentative Specifications for methods of testing for local thickness of electro-deposited coatings on steel, of the American Society for Testing Materials.

A new method of measuring chromium plate thickness<sup>66</sup> has been developed which is based upon the principle that the amperages required for anodic dissolution of a given small area of chromium plating

are directly proportional to the thicknesses of the plate. The areas stripped for test are circular, either 4.8 or 2.4 mm. in diameter. The moment the area has been completely stripped, the potential in this area changes sharply.

Interesting work has been initiated on methods of testing for the adhesion of the electrodeposit. For example, one method is described in which the deposit is so applied that it can be peeled from the top of a test panel, thus giving the investigator a chance to take hold of the deposit and pull it off. The pounds required either to peel or break the plate will indicate its adhesion to the base metal. A practical shop tool for this purpose was developed by F. C. Mesle,<sup>67</sup> consisting of a slotted 1/4-in. drill rod connected to a steel wire coil spring. The plate is peeled after the manner of opening a sardine can. The tension put on the spring is the measure of the load required to peel or break the deposit. Each fraction of a turn is given a number that indicates the load required.

## References

- <sup>62</sup> The Monthly Review, American Electroplaters' Society, 1938, p. 581. See also "Nickel Plate—Why and How," by Adolph Bregman, THE IRON AGE, Aug. 31, 1939, pp. 32-35.
- <sup>63</sup> Transactions Electrochemical Society, 1939.
- <sup>64</sup> Journal Electrodepositors' Tech. Soc., 1938, pp. 201.
- <sup>65</sup> Journal Electrodepositors' Tech. Soc., 1939, pp. 127-40.
- <sup>66</sup> "Studies in Bright Nickel Plating Processes," by C. B. F. Young, Proceedings, American Electroplaters' Society, 1940.
- <sup>67</sup> Metal Industry, January, 1938, p. 15; February, 1938, p. 77; March, 1938, p. 120; April, 1938, p. 169.
- <sup>68</sup> Proceedings, American Electroplaters' Society, 1938, p. 147.
- <sup>69</sup> Metal Industry, December, 1938, p. 560.
- <sup>70</sup> Transactions, Electrochemical Society, 1938, p. 377.
- <sup>71</sup> Covered by patents of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
- <sup>72</sup> "Magnesium as a Control Agent for Zinc Anodes," by R. O. Hull; Proceedings, American Electroplaters' Society, 1940.
- <sup>73</sup> Monthly Review, American Electroplaters' Society, 1938, p. 71.
- <sup>74</sup> Monthly Review, American Electroplaters' Society, 1939, p. 593.
- <sup>75</sup> Mathers and Gilbertson, Trans. Electrochemical Soc., 1939.
- <sup>76</sup> Transactions Electrochemical Soc., 1938.
- <sup>77</sup> Transactions, Electrochemical Society, 1938.
- <sup>78</sup> Transactions, Electrochemical Society, 1938.
- <sup>79</sup> "A Study of Silver Plating for Industrial Applications," by Dornblatt, Lowe and Simon; Proceedings, American Electroplaters' Society, 1939, p. 214. See also the book, Silver in Industry, by Addicks; Reinhold Publishing Co.
- <sup>80</sup> Transactions, Electrochemical Soc., 1939, p. 185.
- <sup>81</sup> "The Future of Electroplating," by C. G. Fink, Metal Industry, April, 1940, p. 209.
- <sup>82</sup> Proceedings, American Electroplaters' Society, 1938, p. 137.
- <sup>83</sup> Transactions, Electrochemical Society, 1938, p. 417.
- <sup>84</sup> Monthly Review, American Electroplaters' Society, 1938, p. 13.
- <sup>85</sup> Monthly Review, American Electroplaters' Society, 1938, p. 91.
- <sup>86</sup> Ober, Flae. Chem. Technik, 1938, p. 11.
- <sup>87</sup> THE IRON AGE, April 6, 1939, p. 39.
- <sup>88</sup> "Electrodeposition of Black Molybdenum Finishes," by R. A. Hoffman and R. O. Hull, Proceedings, American Electroplaters' Society, 1939, p. 45.
- <sup>89</sup> "Iron and Steel Descaled and Structural Steel Cleaned and Dehydrated by the Oxyacetylene Process," THE IRON AGE, April 20, 1939.
- <sup>90</sup> "Cathodic Treatment of Copper in Solution of Beryllium Sulphate to Prevent Tarnishing," by D. T. Ewing and G. W. Jernstedt, Proceedings, American Electroplaters' Society, 1940.
- <sup>91</sup> Research Paper RP 1293, "Outdoor Exposure Tests of Electroplated Nickel and Chromium Coatings on Steel and Non-Ferrous Metals," by Wm. Blum and P. W. C. Strausser, Journal of Research of the National Bureau of Standards, Vol. 24, April, 1940. For sale by the Superintendent of Documents, Washington, D. C.
- <sup>92</sup> "A Suggested Basis for Specifications of Electroplated Coatings of Nickel and Chromium," by A. W. Hothersall, Transactions, Electrodepositors' Tech. Society, 1939, p. 195.
- <sup>93</sup> A. S. T. M. Specifications A 164-39T; A 165-39T; A 166-39T.
- <sup>94</sup> Proceedings, American Electroplaters' Society, 1939, p. 24.
- <sup>95</sup> "Porosity Tests for Electroplated Coatings," by P. W. C. Strausser; Proceedings, American Electroplaters' Society, 1939, p. 194.
- <sup>96</sup> "An Electrolytic Chromium Plate Thickness Tester," by S. Anderson and R. W. Manuel, Transactions Electrochemical Society, preprint 78-3, 1940.
- <sup>97</sup> "The Adhesion of Electrodeposits," by F. C. Mesle; Proceedings of the American Electroplaters' Society, 1939, p. 152.

**Ed. Note:**—Next week the author concludes this study with data on miscellaneous plating developments, organic finishes, and equipment and supplies.

## Locking Nut Reused Without Loss of Grip

A LOCKING nut that can be taken off and reapplied many times without losing its gripping power is announced by Security Metal Products, Inc., 350 East Kalamazoo Avenue, Kalamazoo, Mich. The nut, designated as the Security nut, can be tightened up or backed off part way, years after its application, and still will retain its grip on the bolt. Gripping element is a slightly elliptical



shaped spring steel retainer permanently seated in the head of a standard nut. When nut is applied, retainer is distorted from the elliptical to a circular shape, setting up spring pressure between bolt threads and retainer threads. Neither the threads of the bolt nor of the retainer are injured when applying or removing. The nut meets thread-pitch tolerances of National Screw Thread Commission.



# Trends in Arc Welding

**T**HE steady trend towards arc welding has been greatly accelerated, particularly during the last six months by the pressing need for rapid expansion of welding capacity in all branches of metal fabrication to meet the defense program requirements. Analysis and observation shows that the pressure to obtain production has intensified the careful selection of methods best adapted for specific operations. Increasing attention has been focused on economy of the welding operation, the operating efficiency, overall machine performance, and first cost.

## Use Higher Capacities

In the larger welding operations, economy of operation obtained by positioning the work and using high current downhand electrodes with attendant higher rates of metal deposition has emphasized

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the trend to more high capacity welding units—400-amp. d.c. and 500-amp. a.c. units.

More attention is being paid to weld appearance, uniformity and

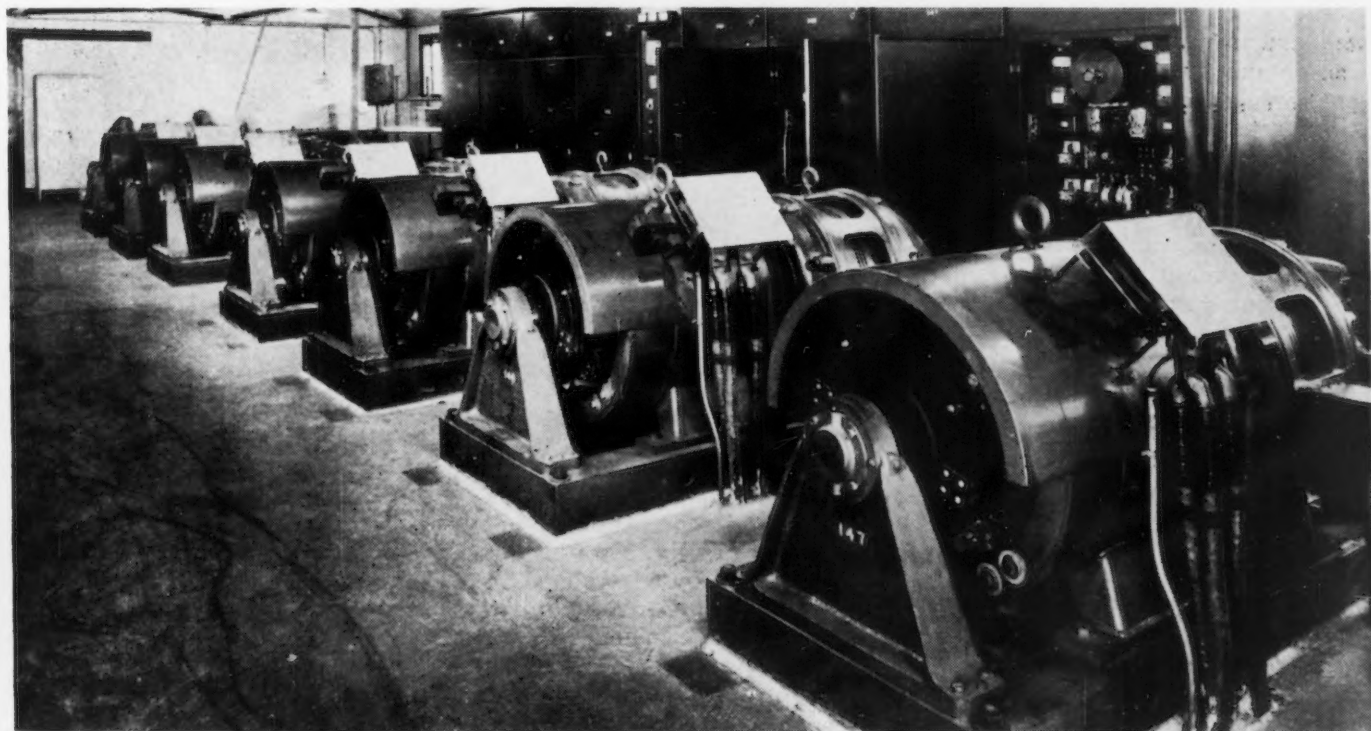
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These seven 1500-amp. welders serve the multiple operator welding circuits in a large shipyard. The sets operate in parallel, and on installations of this size each set is usually figured to serve an average of 30 operators. Its operating efficiency, normally comparatively low, increases rapidly where large numbers of operators, working at relatively low load factors, are employed.

soundness, without sacrifice in speed. This, if anything, tends to produce higher average weld quality with more exacting demands on electrode performance.

New operating requirements are being met by improved d.c. single operator, a.c. single operator, and multiple operator d.c. welders. Other notable trends are the low cost—but adequate—sets for mass training of operators for the defense program; and the increasing attention towards safe-guarding the operator by improved electrode holders and better codes of safe practice.

For outdoor operation, single operator welders have not been, and are not now considered, weather-proof. Canopies of steel and canvas, cumbersome but effective, are ordinarily used to provide protection against severe weather. The trend among most users is to



require better enclosures on the welders themselves, and now machines are designed to withstand almost any weather conditions except driving rain or snow storms without canopy protection.

#### High Power Factor Welders

The need for placing additional load on existing shop supply circuits without wiring changes, and the desirability of keeping down the cost of new installations has focused attention on electrical efficiencies, power factors, and no-load losses of arc welding machines. These conditions have justified the development of high power factor transformer welders, with capacitors built into the machines.

A welder does not represent an ideal type of load to which an individual capacitor should be applied, because of the relatively high percentage of idle time and the wide range of load in a diversified operation. Yet where a group of welders are operating together even on widely varying conditions of load and operator diversity factor, capacitors properly selected and applied to the individual welder, will raise the average power factor as high as 100 per cent and reduce the total kva. input to a point substantially below the kva. input of an equivalent number of d.c. welders under the same load conditions.

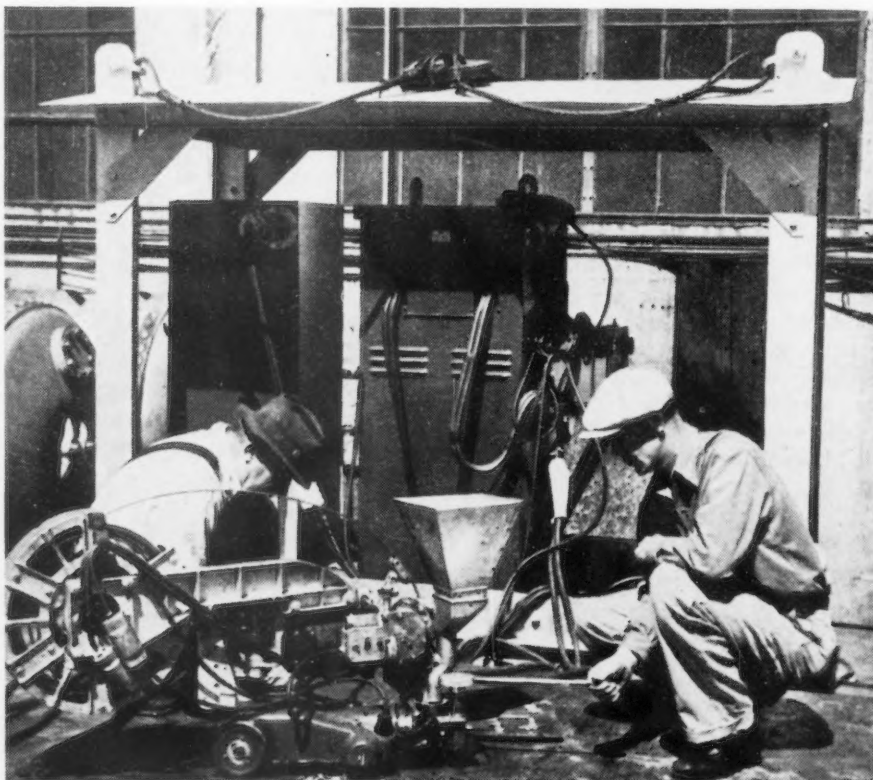
For example, a group of 10 500-amp. high power factor welders operating at a load of 375 amp. each and a diversity factor of 60 (six on and four off at any given time) would have an average operating factor of 96 per cent and a total input of 105 kva. A group of 10 400-amp. a.c. motor driven d.c. welders operating under the same load conditions would have an approximate overall power factor of 83 per cent and a demand of 195 kva.

#### More Multiple Operator Welders

In many phases of shipbuilding operations, similar considerations of striving for greater economy of operation, economy of first cost, and adaptability, have emphasized the value of multiple operator d.c. welding systems, consisting of constant potential welding motor-generators with individual circuit controls. Operating conditions are such that it is possible to load these

machines with a total connected welding circuit rated load that far exceeds the actual nameplate rating of the welding generator. Allowable conditions of loading have been developed by experience rather than by engineering calculations.

multiple operator units require motor-generators completely assembled with motor and generator control, thus making up a self-contained welding power sub-station which may be picked up as a unit by a crane and moved when occasion requires, with a minimum



High speed, heavy duty welding as performed by Unionmelt process, developed by Linde Air Products Co., calls for 1000-amp. a.c. units operated singly or in parallel. The 1000-amp. unit shown is supplying current to the automatic welding head set in position to make welds in 1-in. plate. On some installations, as many as four 1000-amp. welders are used in parallel, providing current range from 200 to 4800 amp. under load without shifting electrical connections.

For example, in some locations 1500-amp. welders, usually operated in groups of four in parallel, are serving mixed tacker and production welder circuits of a total number which would allow an average, based on generator rating, of but 65 amp. or even as low as 50 amp. per circuit. That is to say, experience shows it is possible to load 6000 amp. of installed capacity with as many as 120 operators under conditions of sufficiently diversified load. Each operator is provided with his individual circuit control panel usually of 200 or 300 amp. maximum capacity. The welding power plant under these conditions of loading is usually operating at maximum load and maximum efficiency with no idle-time losses.

Broadening requirements for

amount of wiring change. Welding circuit controls are required for indoor service as well as fully protected controls for service outdoors without field-added protection.

#### Bigger Welding Transformers

Increasing demands for higher current capacities for serving Unionmelt systems of welding have led to higher capacity welding transformers. Numerous operations simply use a number of 1000-amp. welders operated singly or in parallel according to the requirements of the number of heads installed. It is standard practice to build these units with 220/440-volt primaries for connecting to the regular shop circuits.

Larger single units, dry type,



convection ventilated, have been built for taking power directly from the 2300-volt distribution. Where it is necessary or desirable to take power from 2300-volt systems and still retain the diversity of single 1000-amp. units, a system has been developed employing a high capacity transformer, usually of the Inerteen insulated type, which transforms from 2300 volts to 100/85 volts for serving a number of controlling reactors connected in multiple. The reactors are of the dry type and are built in fixed or variable combinations.

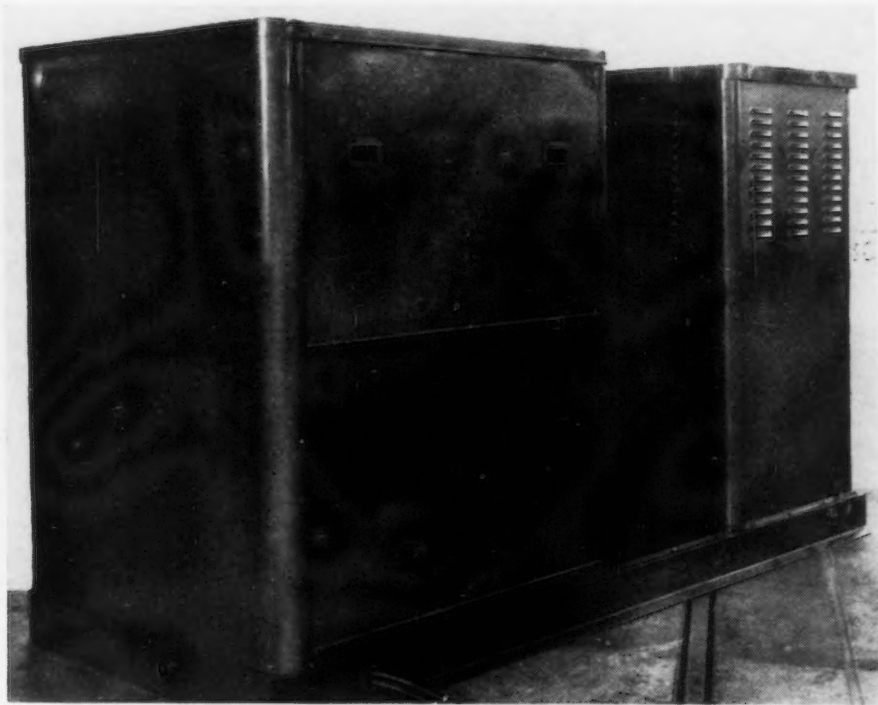
#### Small Welders for Production

In the field of small a.c. transformer type welders, the trend to using more of these units in the industries on production work is evident. Electrode developments have provided electrodes for practically all classes of welding with

extensively applied in operator training schools. The older school of thought was that beginners should be broken in on bare electrodes. That was and is very sound and logical practice for numerous reasons. In the present emergency, however, when many men must be trained and quickly, it is not sacrificing too much to start with coated electrodes, provided instructors sufficiently emphasize the basic principles that are considered to be best taught with bare electrodes.

#### Safety Stressed

Safety and teaching of safe practices to operators have received more attention than ever before during the past year. The fact that all arc voltages and machine open circuit voltages are relatively low has doubtless led to some feeling of complacency on the part of builders and users.



A 2000-amp. single a.c. transformer type welder for serving "Unionmelt System." The welder is designed to give current variation over a range from 400 to 2500 amp. The welder takes power directly from 2300 volt distribution system. The complete high tension and power control equipment is enclosed in separate cubicle as shown on rear of bedplate.

these units. In fact, the development of a.c. electrodes may be said without exaggeration to have brought about higher standards for performance for d.c. electrodes, because all a.c. electrodes must show equal performance on d.c. welding.

Small a.c. welders also have been

Medical opinion and practice does not and cannot fix a "safe" voltage, because the physical characteristics and condition of the individual as well as surrounding working conditions, and character of contact with a circuit, will always vary widely. Conditions that

might be considered satisfactory in normal weather may be quite unsatisfactory during protracted hot spells when welders may be sweat soaked and perhaps not in the best physical condition. Consequently even if thousands of new operators were not being trained and put to work, it would be time to stiffen up on safety practices.

Insulated electrode holders have been improved. Many operators, especially those working on heavy work, prefer to have a short length of unusually flexible cable attached to their holder. This flexibility has heretofore been obtained at the sacrifice of insulation, because an impregnated cotton braid was used instead of rubber as a cable cover. The cable length next to the holder is almost always in contact with the operator and he should have a maximum of protection. The bottom braid does not afford this. A type of neoprene insulated cable has been developed which gives practically the same flexibility as the cotton covered cable, and without sacrificing insulation values.

In connection with safe operating practices, machine open-circuit voltages are coming in for more scrutiny. A good rule to have in mind, since the absolute fixing of limits seems impractical, is simply "the lower the better."

#### Welding Industry Was "Ready"

While no industry should be complacent about its accomplishments, it can be considered to the credit of the welding industry—and the term as used here broadly includes the manufacturers of equipment, the organized group of engineers represented by the American Welding Society, and the various industry groups who have standardized their own procedures in conjunction with the A.W.S.—that this industry was READY for the present defense program. While all the answers have by no means been found and there is still much to be done in having national codes of procedure and operator qualification codes universally adopted, nevertheless the industry stepped from the requirements of normal operation into a tremendously accelerated production of welding machines and welded products with a minimum of lost time and no confusion.

# New Equipment . . .

## Material Handling:

Here are described new industrial trucks and works locomotives, new hoists and cranes, magnets and pulleys, pallets and scales.

### High Lift Truck

**M**ANUFACTURED by the *Baker-Raulang Co.*, Cleveland, is the new Type H-2 series F Hy-lift truck of 4000 lb. capacity. Lifting is accomplished by a hydraulic system, consisting of a gear pump driven by its own motor and connected to the lifting cylinder through control and release valves. These are of the metering type, permitting accurate control of speed at all times. Standard lift is 60 in. and telescopic lift, 119. The new model can operate in aisles 61 in. wide. It is light yet strong and rugged in construction.

### Clamp Lift Truck

**F**ORK type truck with automatic clamps for handling tin plate, loose stacks of sheet metal, etc., is announced by the *Mercury Mfg. Co.*, Chicago. This model A-2440 is a four-wheel steer machine with two wheel drive and has a capacity for 4000 lb. It loads up to 36 in. in length and is powered with a heavy duty double reduction drive

axle assembly. The travel controller is the new Mercury double unit mechanical contactor type, which provides four speeds in either direction and has separate manual control handles for travel direction and speed selection. The hoist mechanism is a hydraulic type requiring a minimum of battery power. Fork lift and overall height of the truck are left open to meet specific requirements.

### Compartment for Truck Batteries

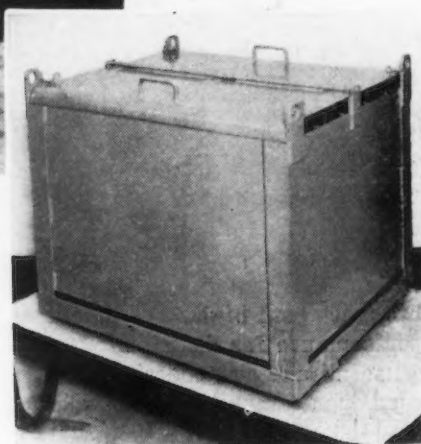
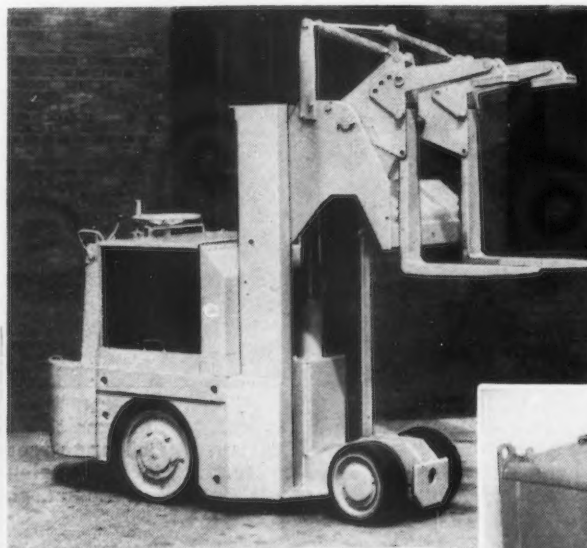
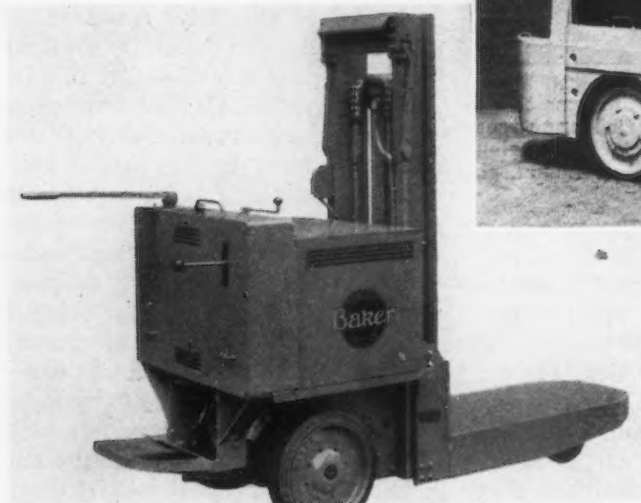
**D**EMOUNTABLE steel compartment for industrial truck batteries was developed by Edison Storage Battery Division of *Thomas*

*A. Edison, Inc.*, West Orange, N. J. This permits quick exchange of entire unit, including battery, and provides secure attachment to truck. Use of demountable compartments is growing due to the increased number of industrial trucks operating 16 to 24 hr. a day.

### Fork Truck

**L**IFTING, carrying, tiering fork truck that will handle loads as heavy as 7000 lb. and tier them in piles 15 ft. high is introduced by *Clark Equipment Co.*, Battle Creek, Mich. This Utilitruc is made in several models, including straight lift, tilting and telescopic tiering.

It is fitted with heavy steel fingers, chisel pointed, adjustable lengthwise and side-wise. These may be inserted under cleated or uncleated loads. The machine is powered with a 6-cylinder heavy duty motor, travels at 1 to 7 miles per hr., has rear wheel steering and hydrau-







lic brakes. Lifting unit is a hydraulic vane type oil pump driven by special direct drive from motor and running consistently at two-thirds engine speed.

#### Hand Lift Truck

**N**EW hand lift trucks were introduced by the *Barrett-Cravens Co.*, 3250 West 30th Street, Chicago, known as models GX and FX having capacities of 2500 and 3500 lb. respectively. They have a full lift of 3 in. accomplished with



either four full or 13 short strokes and are made in sizes ranging from 30 to 144 in. in length, wheel diameters 6 to 11 in., and 18 or 24 in. width. Wheels are ball bearing equipped. Both types of lift trucks have angle lift and a spring handle holdup.

#### Heavy Utility Transfer Truck

**T**RUCK originally designed for transfer of batteries only has been adapted for handling dies and other heavy units by *Lewis-Shepard Sales Corp.*, 295 Walnut Street, Wattertown, Mass. This heavy arc-welded steel frame truck has an ad-

justable deck which can be raised 1 in. at one end and has dimensions 44 by 30 in. Load capacity is 2500 lb. The large size wheels are roller bearing equipped and have rubber tires and pressure lubrication.



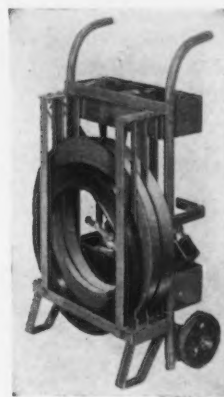
#### Machine Tool Mover

**O**PEN end hydraulic lift truck brought out by the *Lewis-Shepard Sales Corp.* is especially adapted for the moving of machine tools. The truck has extra wide spreading arms and is of strong construction. The hydraulic mechanism lifts and lowers the load gently. Large wheels ensure smooth travel and a hitch is provided for coupling with trailer. Capacity up to 15,000 lb., platform size 78 by 60 in. Special pick-up adapters are provided for the various loads to be transported.



#### Strapping Accessories Truck

**A**LL-STEEL truck has been developed by *Signode Steel Strapping Co.*, 2608 N. Western Avenue, Chicago, for transportation of coils of Bulkbinding strap and tools. Coil



cradles are adjustable for various width of strapping and will accommodate three sizes together. These cradles facilitate the dispensing of strap. Roller bearing, rubber tired 7-in. wheels make for easy, quiet rolling, and for uneven ground 12-in. diameter wheels are obtainable.

#### New Half-Ton Lift Truck

**A**SHEET metal deck permits a new ball bearing lift truck to be used with or without skid for loads up to 1000 lb. Produced by

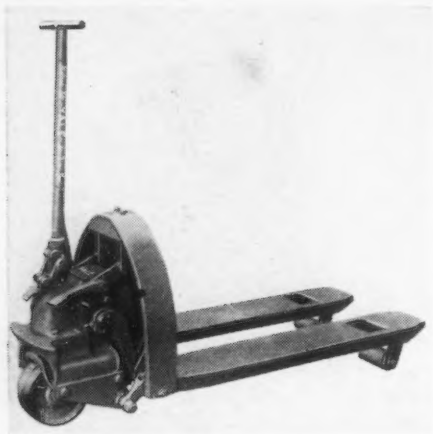


the *Barrett-Cravens Co.*, it has platform heights of 3½, 6, 7 and 9 in. Width is 18 in. and lift 2 in. Skids of 2 x 4 ft. size are available.

#### Hand-Operated Pallet Truck

**P**ALLET-LOAD handling economies are accessible to hand truck operation through the new Y4RP-9 model of *Yale & Towne*

Mfg. Co., Philadelphia. It provides an effortless lift for loads by a multiple stroke lifting mechanism and safe lowering through an hydraulic release. The fork frame is designed for easy entry between pallet decks and the rollers and



wheels are spaced effectively for engagement with the lower pallet deck. Rollers and wheels are ball-bearing equipped and truck travels smoothly. It is made in frame widths: 25, 27 and 30 in. and frame lengths: 36, 42, 48, 54 and 60 in. Load capacity up to 4000 lb.

#### Fireless Steam Locomotive

RECENTLY *H. K. Porter Co., Inc.*, 4948 Harrison Street, Pittsburgh, has developed a fireless locomotive for use in plants where fire and explosion hazards exist. This narrow gage locomotive is equipped with a large storage tank charged from a stationary boiler and insulated by means of a 3-in. thick lagging at 85 per cent magnesia. It is built for a steam pressure of 425 lb. and has a capacity of 41.6 cu. ft. Drainage and safety valves are provided. Charging time is between 10 and 20 minutes. Engine is connected to the rear axle by means of a chain drive, front axle is driven by side rods. Traction force is 1333 lb. Brake shoes are asbestos-lined to prevent sparking.



#### Blast Furnace Skip Hoists

THE *Atlas Car & Mfg. Co.*, Cleveland, has recently adopted a new lining for blast furnace skip hoists. These liner plates are cast in special wear-resisting Meehanite. The skip hoist shown contains 15 liner plates, 1¼ in. thick riveted on to the steel shell of the car. Such units carry the blast furnace charges to the furnace top and it is expected that the new lining will stand up very well under the severe service conditions of heavy abrasive action.

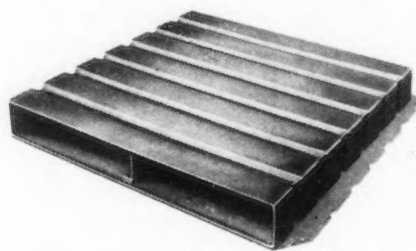
#### Fireless Locomotive for Open Hearth Plants

OPEN-HEARTH plants have their own problems for locomotive traction and the new Heisler open hearth special fireless locomotive of *Heisler Locomotive Works*, Erie, Pa., attempts to solve them. Waste heat steam of pressures as low as 100 lb. may be used. Built low and narrow, 9 ft. 2 in. high and 6 ft. 6 in. wide, it can take sharp bends of only 40 ft. radius. Average steam consumption is 578 lb. of steam per hour. When charged at 120 lb. steam pressure, average

work can be performed for five hours on one charge. Charging requires about 17 min.

#### Steel Pallets

TRUSCON steel pallets produced by the *Truscon Steel Co.*, Cleveland, are designed to combine with minimum weight efficient service for many years under severe conditions. They are formed from steel sheets strengthened by deep ribs and specially formed corners.



The ends are reinforced by wire which is wrapped and welded with the steel sheet at the opening, giving rigidity at points where abuse is heaviest. For safety, sharp edges or corners have been avoided. Three types are available: Double face, semi-double face and single face pallets.





#### Shunting Locomotive with Pusher Arms

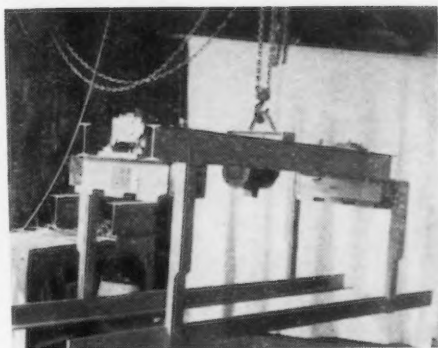
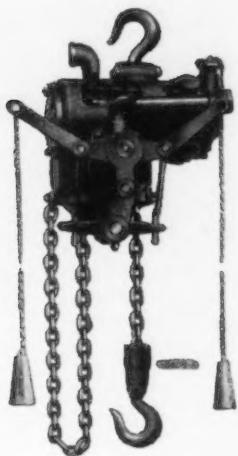
**A**LSO by the *H. K. Porter Co.* is a new type of shunting locomotive which operates between the standard tracks on a 42 in. narrow gage and moves freight cars on the standard rails by extending arms. This 40-ton pusher locomotive is powered by two 100-hp. Westinghouse motors and the current is picked up on a third rail. Motors are equipped with anti-friction bearings. Air compressor operates brakes and pusher arms. Size of engine is 36 ft. by 15 ft. high and



51 in. wide. Tractive force is rated at 20,000 lb. with a maximum at 30,000 lb.

#### Air Driven Hoist

**L**IGHT loads up to 700 lb. can be hoisted with the new Air-Bloc brought out by *Ingersoll-Rand Co.*, Phillipsburg, N. J. This flexible, welded, link-chain air hoist is available in three sizes, LC-3, -5 and -7 for 300, 500 or 700 lb. Hoist weighs less than 75 lb. itself and can be moved easily from one job to the other. The motor supplying the power is a four cylinder, radial type air motor which, according to the maker, cannot be injured by overloading. Safety devices lock the load when air supply fails and prevent damage from overrun of chain.

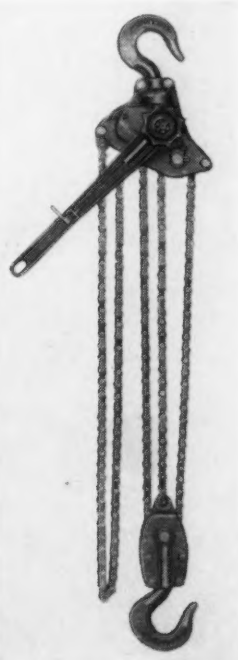


#### Sheet Grab

**S**HEET transporting difficulties can be overcome with the aid of the Mansaver unit produced by the *J-B Engineering Sales Co.*, New Haven, Conn. This apparatus is attached to an over-head crane and consists of two L-beams opposing one another. Sheet steel up to 50,000 lb., boxes, etc., can be gripped and picked up by moving the two beams together. This movement is actuated through a worm gear by a motor placed between the two carrying beams.

#### Hand Hoist

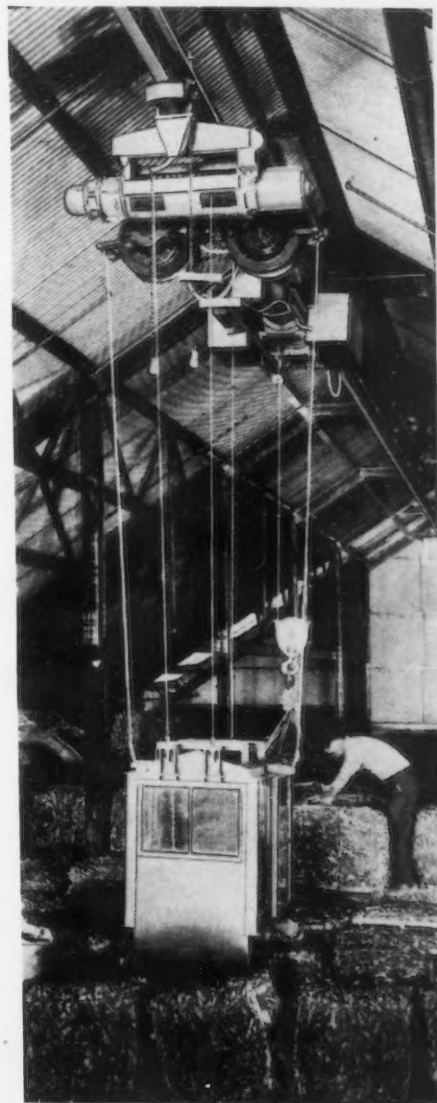
**A**S addition to its line of Pul-Lift portable hoists, *Yale & Towne Mfg. Co.*, Philadelphia, announces the 4½ ton model, so that a complete range of ratchet type chain hoists can be had from ¾ to 6 ton capacity. This is a light weight hoist, yet strong enough to take care of all jobs within its rated capacity. The unit may be used both for lifting and pulling, vertically or horizontally. Yale safety hooks



which are incorporated in the design ensure that no severe overloading can pass unnoticed, by opening slowly and warning of danger.

#### Tramrail Crane

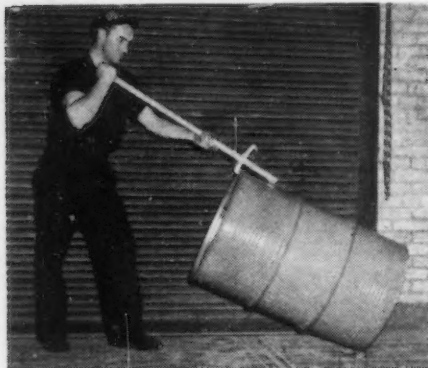
**N**EW type of tramrail carrier with raise-lower cab has been developed by the *Cleveland Crane & Engineering Co.*, Wickliffe, Ohio. This equipment is produced either for the raising and lowering of load and driver's cab together, or to perform these tasks independently.



With the raise-lower cab unit, one operator can take care of all operations: attaching load, moving by traveling crane and detaching. This is particularly useful when using a lifting fork, as the man can obtain a full view and thread the fork under the pallets easily. Also due to a vertically adjustable position, he will be able to stack the goods in tiers with greater accuracy, safety and efficiency.

### Barrel and Drum Tipper

**D**EVISE for the safer and quicker handling of barrels and drums has been developed by the *Lewis-Shepard Sales Corp.* This



is a tool consisting of a long handle with pronged, adjustable collar to fit all types of drums and large or small bilged barrels and designed to tip them out of or into a horizontal position.

### Magnetic Pulley

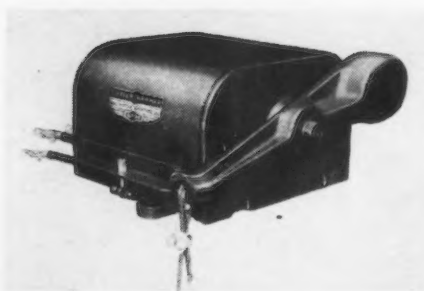
**M**AGNETIC ENGINEERING & MANUFACTURING CO., Clifton, N. J., has developed a magnetic pulley of unusual size. It is 42 in. in diameter and 64 in. wide and weighs approximately 16,000 lb. The unit is used as head pulley for a conveyor belt carrying lump ore. Radial and horizontal openings



through the pulley allow for free air movement and provide large radiating surfaces for adequate cooling. Uniform magnetic pull across the face of the pulley is obtained by means of specially designed pole pieces, cast with the pulley. The coils are wound on steel bobbins so that they may be independently removed for repair or replacement.

### Crane Limit Stop

**C**UTLER-HAMMER, INC., Milwaukee, announces a new type main circuit crane safety limit stop to prevent overtravel of the crane hook when hoisting. The new device operates by means of a counter-



weighted lever and a suspended reset weight. As the hook approaches its limit of travel the reset weight is lifted, thus allowing the counterweight to trip the switch. A quick break and make mechanism opens the normally closed power contacts to disconnect the motor from the line and connect the resistor across the motor circuit, establishing smooth, quick, dynamic braking. The motor is weather-proof and rates 100 hp. to 230 volts, d.c.

### Electronic Level Control for Liquids

**P**HOTOSWITCH electronic level control type P30 produced by *Photoswitch, Inc.*, 21 Chestnut Street, Cambridge, Mass., permits level control in tanks and containers of both conductive and non-conductive liquids. For two-level control, probe fittings are attached to the tank at levels representing switch-on and -off of pump. These probes are wired to the electronic lever control. Special fittings are available for use in corrosive liquids.

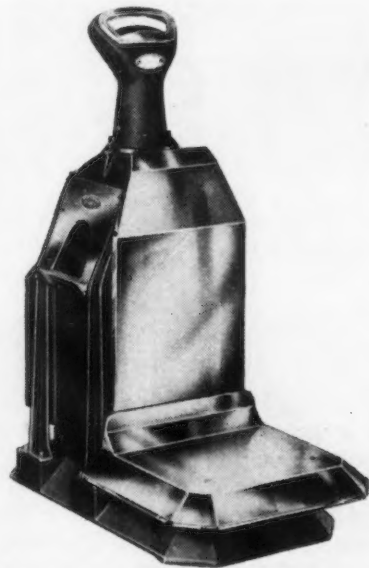
### By-pass Tilter

**W**HEREVER heavy coils may follow two alternative lines in a steel works, the new by-pass tilter made by *Logan Co.*, Louisville, will prove useful. The illustration shows a typical application: Steel

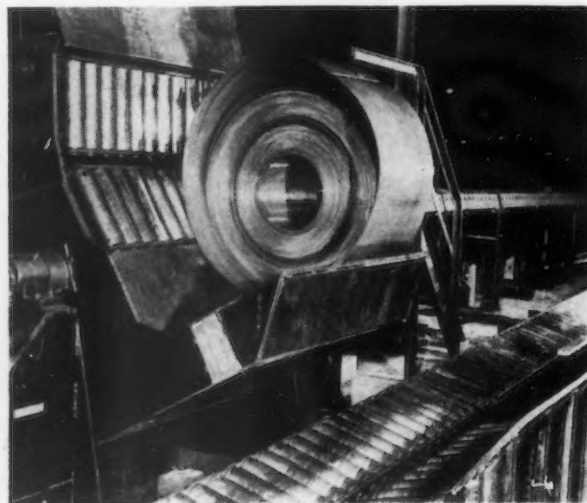
coils coming from the pickling line can either go via the upper level to the cold rolling mill or they may come to the lower conveyor line to be transported along with the material from the hot rolling mill to storage and shipment departments. The by-pass tilter performs the work of bridging the gap and linking two flow lines.

### Industrial Scales

**I**MPROVED scales for a weighing range from 40 to 150 lb. are brought out by the *Exact Weight Scale Co.*, Columbus, Ohio. It is built of aluminum alloy, weighs 130 lb. and is portable. Weighing pan is 6½ in. and weight scale 44



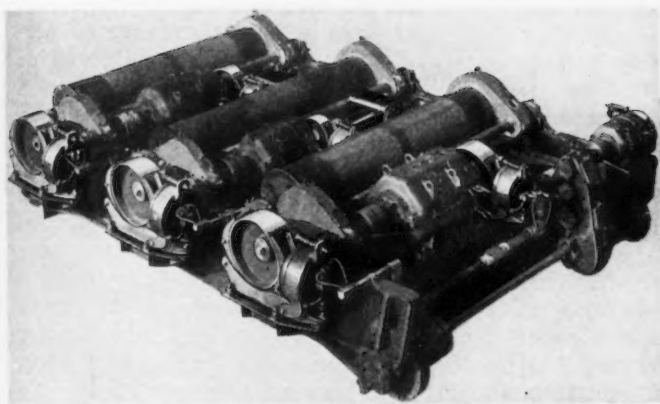
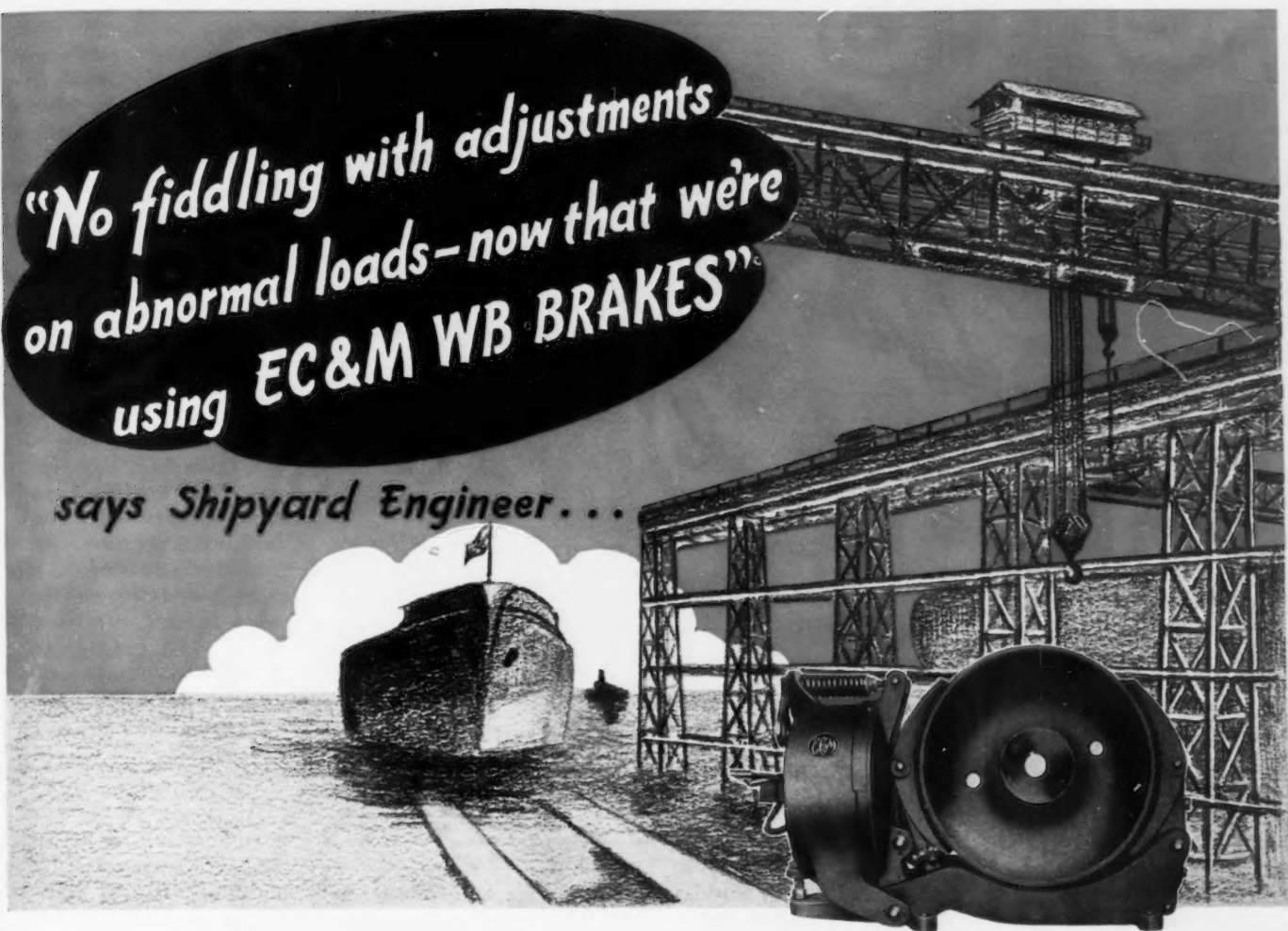
in. above the floor. The dial may be turned for easy reading to face any direction. The small lever fall of 3/16 in. reduces wear on bearings and makes for quick reading together with the air dashpot at the scale.





**"No fiddling with adjustments  
on abnormal loads—now that we're  
using EC&M WB BRAKES"**

*says Shipyard Engineer...*



Seven EC&M Type WB Direct Current Brakes are used on the hoist and trolley motors and Jackshafts of this large ladle Crane Trolley.



Brake blocks used in Type WB Brakes are accurately ground on both sides to uniform thickness...giving precision fit on shoe or wheel.

**"A**LL loads are handled safely and swiftly since equipping our crane-hoists with EC&M Type WB Brakes", reports a shipyard engineer.

"Sending a man up on the trolley to tighten up the brake-spring before attempting to lift an over-capacity load and then sending him aloft again to slack-up on the adjustment after the job is done so that the brake shoes won't drag on normal loads is now a thing of the past".

Infrequent adjustment is an inherent characteristic of EC&M WB BRAKES. This is due to liberal design and precision alignment of working parts. Thick, tough, non-compressible brake blocks which wear down slowly and uniformly also contribute to minimum attention throughout the life of this brake.

Accurately built to HOLD and RELEASE efficiently, EC&M Bulletin 1004 WB Brakes are an economical means to get trouble-free braking. Write for your copy of this descriptive Bulletin today.

**THE ELECTRIC CONTROLLER & MFG. CO.**  
2700 East 79th Street, Cleveland, Ohio



**For BRAKING at Top Efficiency—use EC&M Type WB BRAKES**

**D**ETROIT—If the dictator nations have any question about whether the United States is making full-out preparations for defense, they would have learned something of the seriousness of preparations that are being made by observation at the annual meeting of the Society of Automotive Engineers in Detroit last week. Lobby gossip and technical sessions alike were devoted to the engineering design and production problems of the national defense program. Few of the 21 sessions during the week were related to any other subject and, even in the isolated exceptions it is likely that the subject of defense came up once or twice, at least.

Among the two thousand engineers who attended probably several hundred have had more or less direct opportunity to participate in SAE standardization work and other preliminaries to the full-out program. And almost every engineer present could cite active participation in design or preparation for production of defense requirements in recent months.

If any doubts had existed that this was a defense meeting of engineers, the extensive participation of Army and Navy officers, and a War Department exhibit of military trucks, tanks and guns in Washington Boulevard, in front of the Book Cadillac Hotel here would have added sufficient military flourish to convince the skeptical. Inside was a most interesting display of automotive parts and accessories covered in the studies of the joint standardization committee of the SAE Quartermaster Corps.

#### Progress in Standardization of Army Trucks

Remarkable progress in the direction of standardization of parts for military vehicles is indicated by the work of the SAE-QMC Advisory Committee. Starting during the last week of June, the committee has studied and made recommendations in more than 120 instances. The work so far assigned to it by the Quartermaster General is virtually complete. Recommendations already submitted in final form affect the following items:

Outside door handles, window regulator handles, remote control handles, door dovetails, door hinges, door checks, cab door locks, remote controls, windshield wipers, rear-view mirrors, radiator caps, gasoline tank caps, radiator hose, radiator drain plug, gasoline tank outlet connection, gasoline tank drain plugs, chassis lubrication systems, battery cables, air brake hose fittings, air brake tubing, hydraulic brake hose, hydraulic brake rear axle tee, battery installation, blackout switch, panel lamp switch, ignition

## On The Assembly Line

BY W. F. SHERMAN

*Detroit Editor*

• Impressive display of military preparations put on in Detroit at SAE meeting . . . Defense program dominates all discussions . . . Progress made in standardization of military vehicles . . . Automobile production rebounds after holiday letdown.

switch, headlight dimmer switch, throttle and choke controls, dash instruments, horn, blackout lighting equipment, generator and lighting voltage, generator rating, voltage regulators, ignition coil, distributor caps, distributor rotors, distributor circuit-breaker lever, condenser and stationary contact support, starting motor drives, series-parallel starting switch, wiring code, terminal sizes, reflex reflectors, stop light switches, batteries and cradles, cooling fans, fan belts, engine thermometer connection, oil gage connection, carburetor flanges, air horns, throttle connections, gasoline carburetor connections, oil filler caps, intake-manifold vacuum connection, and oil pan drain plug.

Also subject of much conversation about standardization is the

new series of aircraft materials specifications known as the AMS standards. These have been recently issued by SAE and now total 136 specifications. About another 150 will be forthcoming.

Assailing the generalization that shortages of certain foreign ores and other materials would force us into war, Dr. H. W. Gillett, of the Battelle Institute, addressed one session on "Made-in-America Substitutes." He expressed the hope that there is a "short route to Japan" so his words would be quickly relayed there. Listing tungsten, antimony, chromium, tin and manganese as strategic materials with unusual significance at the present time, he said, "but we have the high cards, the aces and kings to beat the aggressor nations. We also have the jokers in the deck—the substitute materials with which America is blessed." He added that he meant real substitutes, not ersatz materials such as wood pulp overcoats.

Three ways to take care of our needs for vital materials of which we are short were suggested by Dr. Gillett—stock piling, utilization of low-grade ores and and switching to available substitutes.

#### Molybdenum Substituted for Tungsten

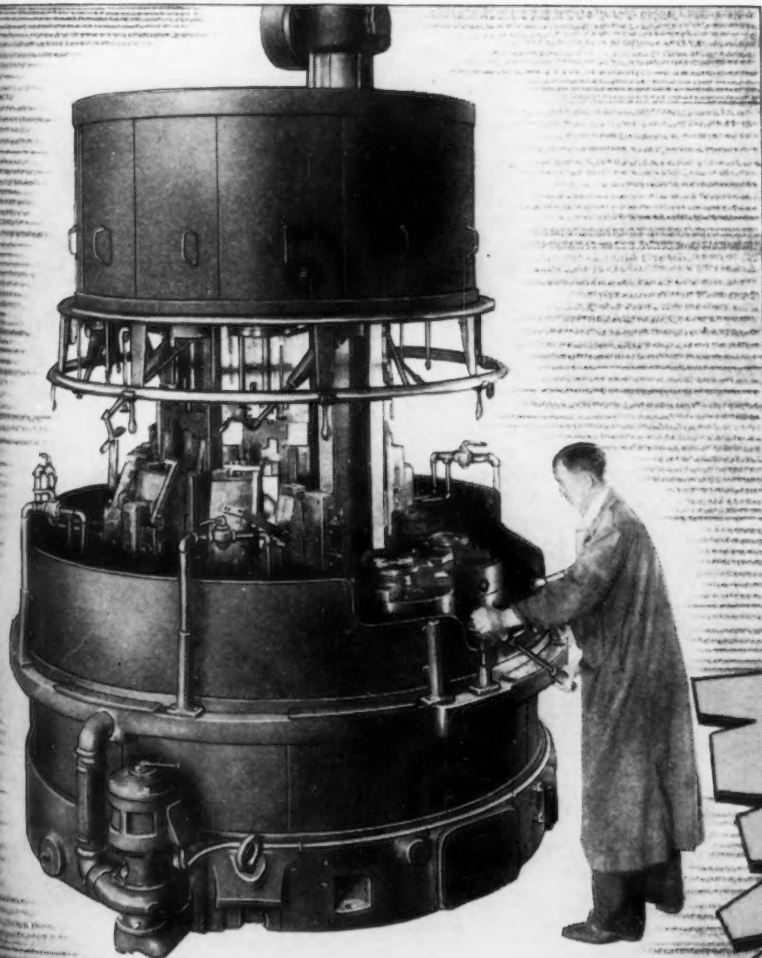
Stock piling of tungsten is already playing an important part in keeping us supplied with this material, he said, but the major requirement for tungsten as an alloy element in tool steels has already been taken care of by the substitution of molybdenum, which is at least a "100 per cent equivalent." Antimony, most of it used now in storage batteries, can be replaced by calcium, he asserted. And antimony can also be reclaimed from old battery plates. For chromium there are no obvious substitutes, but low-grade ores can be utilized to put chromium in tool steels, stainless steel, armor plate and in other places where it is indispen-





# Too Many Cooks—

Below is a Type "D" Mult-Au-Matic. It is available in 6- and 8-spindle types and in various sizes to fit industry's needs.



There's a lot to that old adage—and it fits other things than soup.

For example, it gives a hint as to why many a plant has replaced groups of single spindle machines with one Mult-Au-Matic. The fewer the operators who must handle any individual piece, the fewer the chances for error and the greater the saving in time. Hence, the popularity of the Mult-Au-Matic method.

If you are unacquainted with the Mult-Au-Matic method and its application in modern manufacturing, write our engineering department. We shall be glad to explain in detail, either the general principle and its merits, or to show its application to your specific needs.

**THE BULLARD  
COMPANY**  
BRIDGEPORT, CONNECTICUT



ARTHUR NUTT (left) outgoing president of the Society of Automotive Engineers, and A. T. Colwell, newly-elected president. Mr. Nutt is vice-president of the Wright Aeronautical Corp., and Mr. Colwell is vice-president of the Thompson Products Co.

sable. He suggested a material called Chromax which provides the metallurgist with a technique for alloying satisfactorily.

Shortage of tin for tin plating presents problems, but Dr. Gillett suggested methods which would reduce requirements to a tenth of what they are now. He said that tin plate for cans is not a vital necessity since the basic purpose of tin plating is to provide a method of soldering seams—not to protect foodstuffs. These seams can be welded, he said, and lacquer or plastics can be used for the protecting

coating. He also suggested alternate materials for bearings, soldering and other applications where tin is now used.

Manganese presents our major problem, he said, because the low grade ores available can be used satisfactorily only by paying 50 per cent more than at present for ferromanganese.

Support for the contention that military vehicles must be standardized was presented by Maj. Gen. Edmund B. Gregory, Quartermaster General of the Army. He said that the Army must limit the num-

ber of types and models to the minimum consistent with sources of supply, mass production, interchangeability and cost. Gen. Gregory said that the Army's problem was selection and procurement of types of vehicles which would be able to do the work and still be adaptable to volume production.

"Today we have about 60,000 motor vehicles in service," he said. "By March we expect to have around 100,000 and by the end of the present fiscal year about 190,000. There will remain about 60,000 vehicles to be delivered in the late summer or early fall."

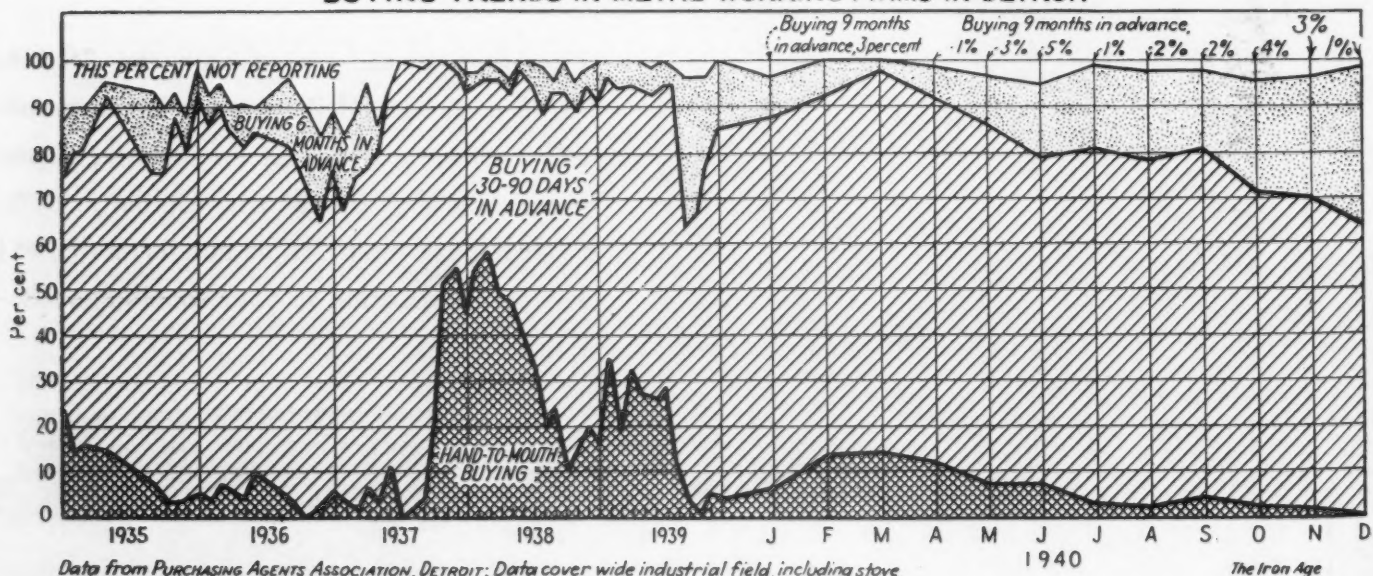
Gen. Gregory listed the types of vehicles which would make up this fleet as follows: motorcycles, 27,000; bantam cars (apparently the term has become generic in the Army since Bantam has been joined in the production of these cars by Ford and Willys), 4500; passenger cars, 5900; ambulances, 3400; 1/2-ton pickup and reconnaissance, 69,000; 1 1/2-ton 4400; 2 1/2-ton, 48,000; four-ton, 3800; 6-ton and heavier, 3800; 2 1/2-ton truck-tractor with one trailer each, 37,800.

The Army is receiving new motor vehicles of about 10 different types at the rate of 25,000 a month, he said. The total of 250,000 vehicles is that required for the proposed Army of 1,400,000 men.

Gen. Gregory praised the SAE-QMC Committee for its work of standardizing parts and accessories, citing the reduction in vari-

(CONTINUED ON PAGE 68)

### BUYING TRENDS IN METAL-WORKING FIRMS IN DETROIT





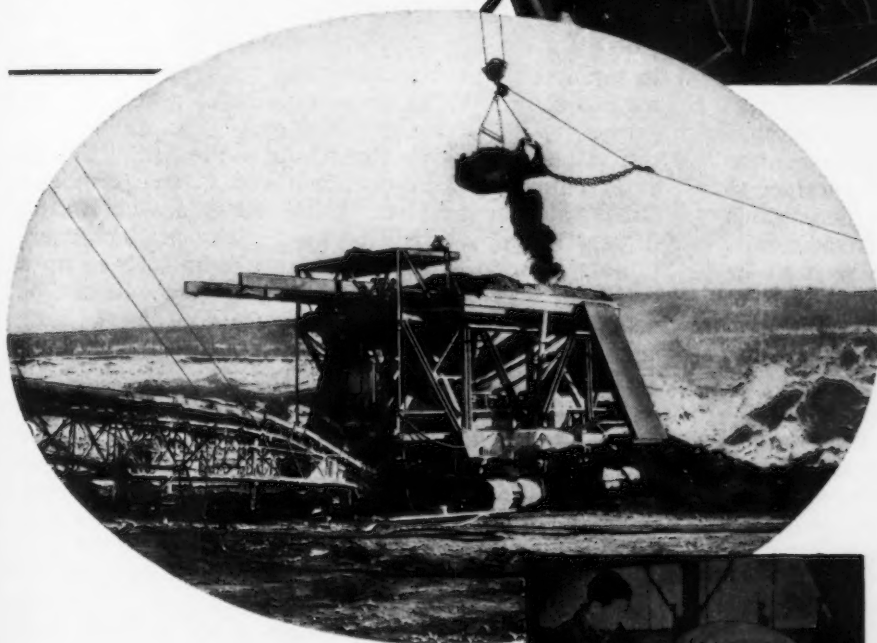
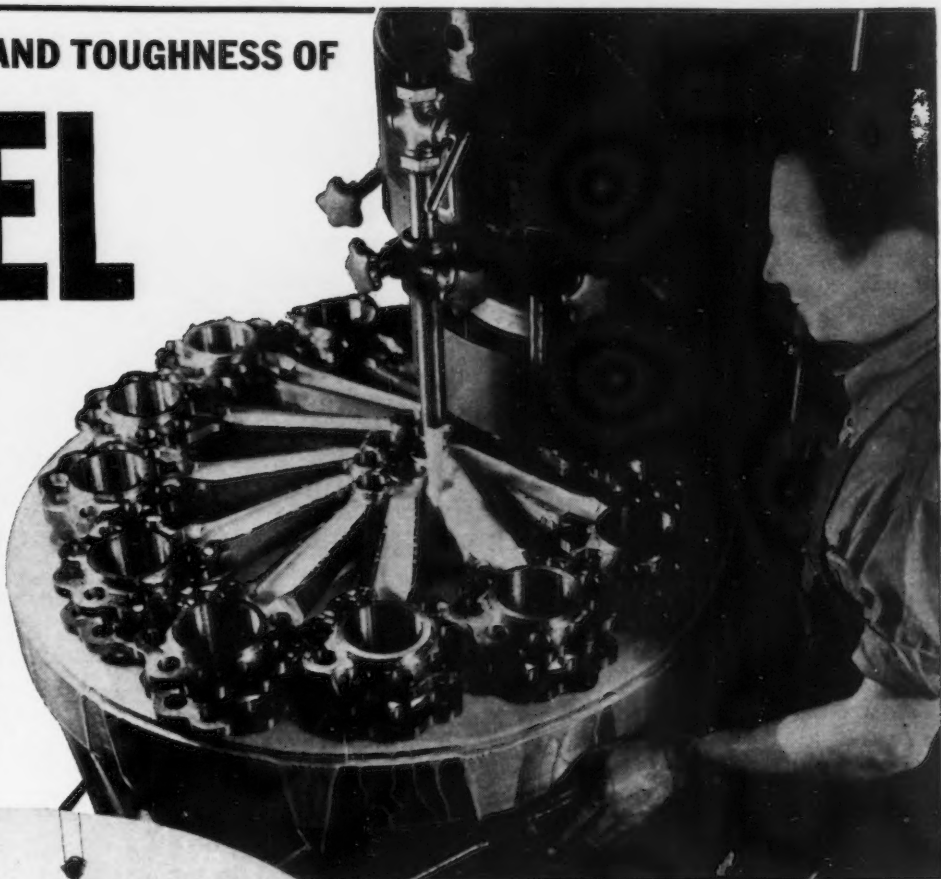
# Safe **DEFENSE** against breakdowns . . .

INCREASED STRENGTH AND TOUGHNESS OF

# NICKEL

ALLOY STEELS

**NEW JERSEY**—Compactness, light weight, high strength and fatigue resistance are life-and-death requirements for aircraft engine parts. Here you see connecting rods of Nickel-chromium-molybdenum steel machined at the Paterson, New Jersey, plant of **WRIGHT AERONAUTICAL CORP.** Through their uniform response to heat treatment and ready machinability at high hardness, Nickel alloy steels simplify production.



**ALASKA**—Stripping 60 million cubic yards of frozen soil from 16 million cubic yards of gold bearing gravel is the job of this Bucyrus-Monighan electric drag line and **BUCYRUS-ERIE** traveling feeder. Working near Fairbanks, Alaska—more than 2,000 miles away from replacement parts—embrittlement and breakage at subzero temperatures must be avoided. More than 17 tons of 3½% Nickel low carbon steel forgings were used, chiefly for shafting. Three tons of 1.50/2.00% Nickel steel castings are also employed. Gears, pinions and crawler parts are heat-treated Nickel-chromium steel. The mile long conveyor belt system, furnished by the **PACIFIC CAR & FOUNDRY CO.**, depends on speed reducer shafts of tough Nickel-chromium-molybdenum steel, SAE 4340.

**NEW YORK**—Cost records show this power-driven **INGERSOLL-RAND** Impact Wrench 6 to 8 times faster and more efficient than hand methods for applying and removing nuts. The hammers and anvils which withstand up to 1100 torsional impacts per minute are Nickel-chromium-molybdenum steel. Nickel alloy steel is readily hardened to prevent battering and stoutly resists wear and fatigue.



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NEW YORK, N. Y.

WASHINGTON — Government economists have been insisting that civilians must be able to get all their peacetime requirements, regardless of defense needs. This view has been emphasized repeatedly and was accepted as an administration policy. But if so, the administration evidently has had one of those changes of mind that is so habitual with it. For certainly the President in his recent broadcast on the "national security" placed civilian requirements in a secondary position.

"I am confident that if and when production of consumer or luxury goods in certain industries requires the use of machines and raw materials that are essential for defense purposes, then such production must yield, and will gladly yield, to our primary and compelling purpose," said the President.

In all this talk about the necessity of expanding steel facilities, economists predicated part of their contention on the premise that there must be no sacrifice to civilian needs. This business-as-usual-attitude, which also was cast aside by the President in his radio talk, held in particular that steelmaking capacity must be increased in order that civilians would be able to get their supplies of "pressed steel" products. The housewife must not be compelled to forego the "sacrifice" that she would encounter if she suffered delay in getting a new refrigerator or a new kitchen range and other household necessities. The impression was given that such products absorbed enormous quantities of steel, and in order to be superimposed on defense production much larger steel capacity will be required. There may be a time when these products, both necessary and convenient for the home, can not be delivered on the spot as they can be today, and it is to be hoped there will never be any delayed deliveries.

#### "Steel Shortage" Talk Unwarranted

But from a point of steel consumption, tonnages required for the manufacture of these products certainly does not justify the noise that has been made about a "threatened steel shortage."

Here are figures which show that refrigerator, washing machine and kitchen range production in 1940 required only about 500,000 net tons of ingots or approximately 0.6 per cent of the total rated ingot capacity of 83,000,000 tons: Refrigerators, about 2,800,000 units, averaging 190 lb. of steel each or 266,000 tons; washing machines, about 1,500,000 units, averaging 60 lb. of steel each or 45,000 tons of steel; kitchen ranges, 425,000 units, averaging 190

*Washington*  
BY L.W. MOFFETT  
*Washington Editor*

**• Government economists have been insisting that civilians must get all their peacetime requirements, but President Roosevelt no longer backs this view, as his fireside chat indicated . . . Organization of Office of Production Management suggests possibility of other changes.**

lb. of steel each, about 40,000 tons.

This makes 351,000 tons of sheets, strips, etc., equivalent to 70 per cent of the ingot tonnage necessary to yield the finished steel.

Figures could be given for other products that are made either entirely or partly of steel which provide comfort, pleasure and service for mankind—radios, musical instruments, swings, chairs, tables, etc.—and aggregated they would represent considerable tonnage in itself, but measured against capacity the ratio would be relatively small. Even so, any people who would not willingly forego temporarily such products, or the latest automobile models, important as they are, certainly have not toughened their fiber to the extent that will be necessary even for a moderate defense effort,

to say nothing of the tremendous plans that are under way as shown by the staggering sums asked of Congress.

The essential thing right now is the production of defense materials in the time and volume required. Other things come next. If the latter are choked off in part it probably will be for no long period. There is no reason to expand capacity simply to take up a brief lag only to find later the capacity will not be needed and will represent a waste of capital, labor and resources.

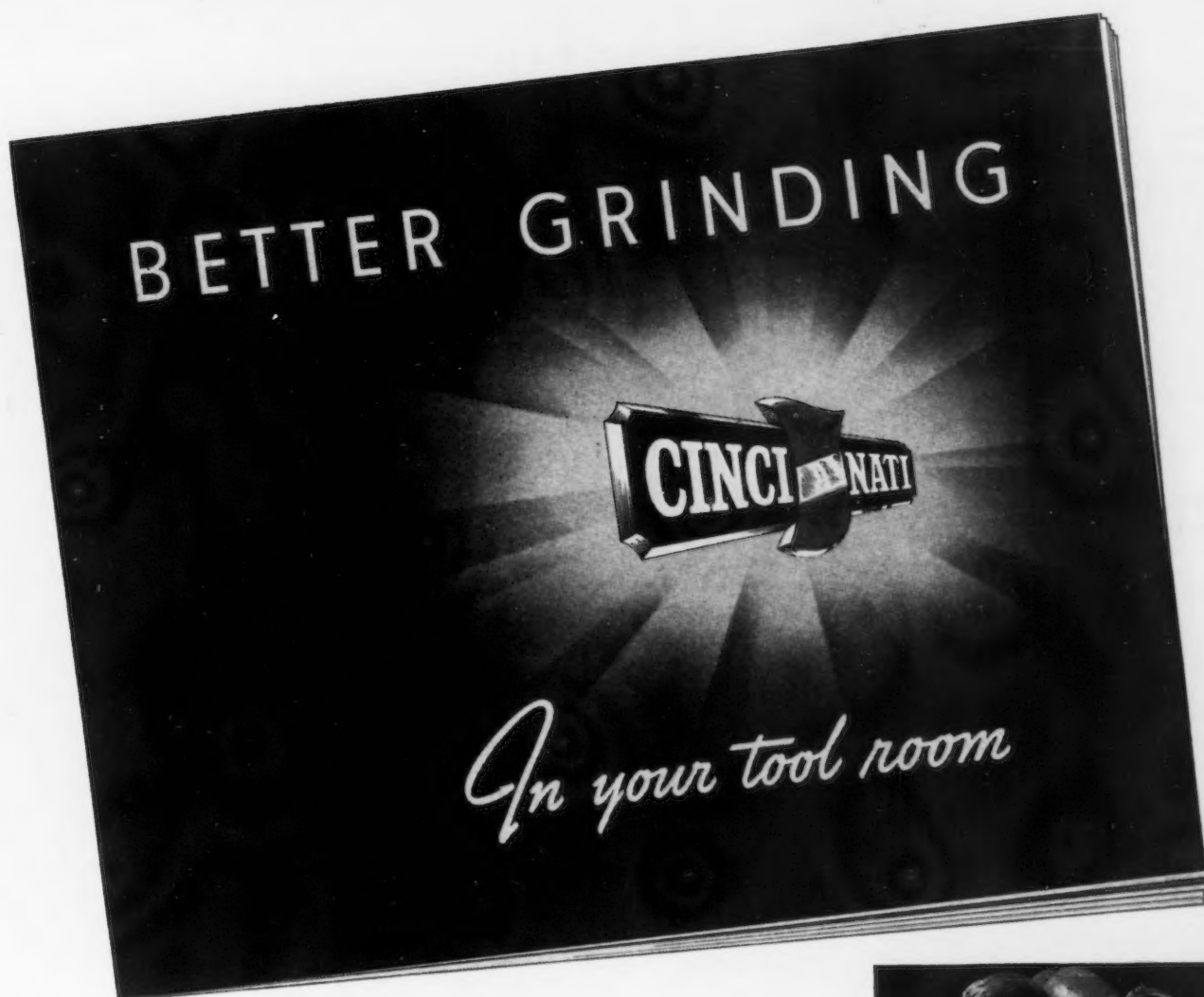
#### No Specific Figures on Defense Needs

Despite all that has been said on the subject there have not been any specific figures on defense steel requirements covering the entire program. By its very nature there can be no such figures, but sufficient approximations have been made to support the argument of adequate steel-making capacity built and building.

One great difficulty the steel industry faces, like that which has inspired complaint by machine tool makers, is that it does not know just what and how much steel the Army and Navy want or when and where it is wanted.

• • • President Roosevelt's executive order creating the Office of Production Management, made public at the White House on Jan. 7, may be the forerunner of other changes yet to come in the government's defense administrative machinery if and when the emergency becomes more acute. Just as the Council for National Defense succumbed in favor of the all-powerful War Industry Board in World War days under intensified wartime activity, so the National Defense Advisory Commission and perhaps ultimately the OPM itself may be relegated to the background to make way for a super-super agency.





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FILMATIC grinding wheel spindle bearings that have never been known to fail — Sensitive controls with which the average operator can size within .0001" on the diameter — Hinged type internal grinding attachment always on the job and ready to use at a moments notice — Speed Ranger built into the headstock provides the right speed for the job, infinitely variable from 55 to 500 r. p. m.

Other features, just as important to better grinding in *your* toolroom, are also illustrated in the booklet, publication No. G-455. Write for your copy today.



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Manufacturers of

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Centerless Grinding Machines      Centerless Lapping Machines

Superficially at least, the President appears to have delegated broad policy-making powers to the four-man agency. All four members—William S. Knudsen, director general; Sidney Hillman, associate director general; Secretary of War Henry L. Stimson; and Secretary of Navy Frank Knox—will determine policy while Messrs. Knudsen and Hillman will execute measures adopted by the full membership. Only rarely, the President said, in emphasizing the extent of the delegated power, will the OPM find it necessary to consult the White House.

To the extent that he divided the authority jointly between Messrs. Knudsen and Hillman, the President turned aside the plea of business that one responsible individual be named to head the government's defense machinery. Yet he went much further in granting the request of labor that it be given an equal voice with industry in the management of the program.

At a press conference on Jan. 7, Mr. Roosevelt declined to answer specifically whether Mr. Knudsen or Mr. Hillman would direct the agency. He compared the new setup to a law partnership, insisting

that its two key figures will always be in substantial agreement, and laughingly told newsmen that reorganization of the defense machinery places one responsible man at the head of the defense program. His name, the President said, is Knudsen-Hillman.

Mr. Roosevelt at the same time issued an order abolishing the Priorities Board and the Office of the Coordinator of Defense Purchases, and sub-divided OPM into three groups: (1) A division of production headed by John D. Biggers, formerly deputy commissioner in Mr. Knudsen's production division; (2) a division of purchase headed by Donald M. Nelson, former coordinator of purchases; and (3) a division of priorities headed by Edward R. Stettinius, Jr.

A new six-man priorities board, of which Mr. Stettinius is chairman, will function as a unit of the division of priorities. Both will serve in a purely advisory capacity, with the OPM taking final action on priorities.

Remaining units of the defense commission will carry on but strictly as advisory groups for and subordinate to the OPM. The commission's Price Stabilization Divi-

sion, for example, will continue to watch prices and make recommendations for keeping them in line. Presumably all present members of the commission, with the possible exception of Mr. Knudsen, Mr. Stettinius and Mr. Hillman, will continue their jobs.

Close examination of the executive order creating the OPM raised some doubts on the actual authority vested in the new agency. The order declared that the director general and associate director general would serve "under the direction and supervision of the President," but at his press conference Mr. Roosevelt placed emphasis on the words "formulate and execute" in describing the OPM's authority in carrying out all policies and measures necessary to insure the increased defense production effort.

The executive order also empowers the OPM to:

1. Take over industrial plants under the "draft industry amendment" if any refuse to cooperate in the defense program.
2. Coordinate the requirements of the Army and Navy, as well as British and other foreign munitions purchases.
3. Fix priorities, assure supplies of raw materials, and organize the placing of defense orders.
4. Function as liaison between the remaining divisions of defense commission, the Army and Navy and other government departments.

Mr. Roosevelt referred also to a new phantom organization—the Office for Emergency Management—and indicated that this was being established only because the technical requirements of the law made it necessary. Although this office can be placed in the same category with the shadowy Council of National Defense, which never meets, some observers thought the new phantom ultimately may be the super-super defense agency if the country goes on a full wartime basis.

Immediately upon being formally established, the four members of the OPM issued a statement in which they warned industry that it must subordinate its concern over the possible future effects of tremendous immediate expansion. At the same time labor was told that "no sacrifices will be asked of it that will not be matched by a corresponding sacrifice on the part of capital."

## THE BULL OF THE WOODS

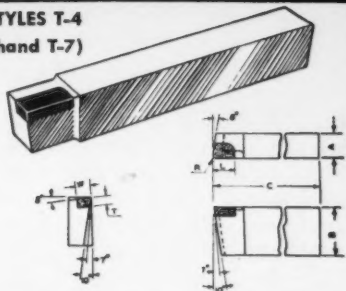
BY J. R. WILLIAMS



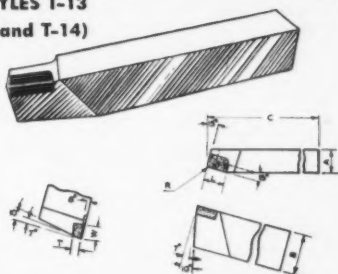


# FOR **FASTER DELIVERY** and MAXIMUM ECONOMY *Specify* THESE **STANDARD** **CARBOLOY TOOLS!**

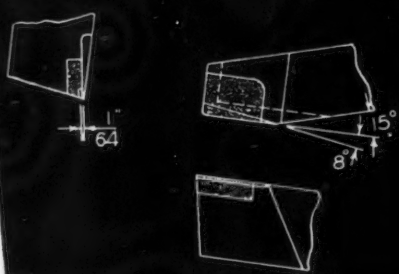
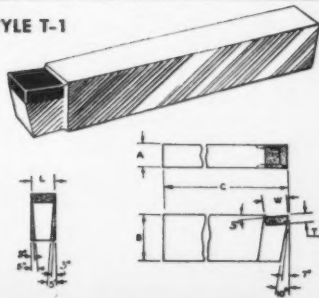
**STYLES T-4**  
(left hand T-7)



**STYLES T-13**  
(left hand T-14)



**STYLE T-1**



## ALL STANDARD TOOLS ARE GROUND READY FOR USE

Steel Cutting Tools Styles 4, 7, 13, 14 have ground-in chip breaker as illustrated above.

  
Look for this triangular trade mark on tools you buy. It is your assurance of genuine Carboloy cemented carbide.

# *Specify* THESE **STANDARD** **CARBOLOY TOOLS!**

## SPECIFICATIONS—CARBOLOY STANDARD TOOLS

TOOL ORDER NUMBER					Shank Size		
Right Hand Style T-4	Left Hand Style T-7	Right Hand Style T-13	Left Hand Style T-14	Style T-1	A	B	C
T-42	T-72			T-12	3/16	3/16	2 1/4
T-43	T-73			T-13	3/8	3/8	2 1/2
T-45	T-75			T-15	1/2	1/2	3 1/2
T-47	T-77			T-17	3/4	3/4	4
T-48	T-78	T-137	T-147	T-18	1	1	4 1/2
T-406	T-706	T-148	T-148	T-106	1 1/4	1 1/4	6
T-140	T-710	T-1306	T-1406	T-110	1 1/2	1 1/2	7
T-403	T-703	T-1310	T-1410	T-103	1 3/4	1 3/4	7
T-404	T-704	T-1304	T-1404	T-104	2	2	7

Vest pocket size 16-page instruction manual packed with each tool.



Standard grades supplied with these tools: Grade 78B for steel cutting. For cast iron, brass, etc., grade 44A and (for longer tool life on rigid set-ups) grade 883.

## FOR "UNIVERSAL" SHOP USE ON 80% OF ALL STEEL, CAST IRON, ETC., TURNING, BORING, FACING JOBS

For fast delivery, maximum economy, easy ordering and simplified stocks, specify the new, recently announced Carboloy Standard Tools.

Just five styles—in three grades—are designed for universal use on 80% of all turning, boring and facing jobs on steel, cast iron, brass, etc. Rapid grinding procedure permits grinding innumerable variations in each tool. Proper carbide grade

selection—often a problem—is practically automatic with these new standards. One grade for steel cutting; two for cast iron, brass, etc.

Take advantage of the new economies and broader uses now possible with Carboloy Tools through these simplified design and grade selection features and the new low prices (approaching the price of ordinary tools). Write for Catalog GT-125.

CARBOLOY COMPANY, INC., 11153 E. 8 MILE BLVD., DETROIT, MICHIGAN  
Chicago • Cleveland • Los Angeles • Newark • Philadelphia • Pittsburgh • Worcester, Mass.

# CARBOLOY

TUNGSTEN CARBIDE—TANTALUM CARBIDE—TITANIUM CARBIDE

FOR CUTTING, DRAWING, SHAPING, EXTRUDING METALS AND NON-METALLICS ★ FOR REDUCING WEAR ON EQUIPMENT OR PRODUCTS YOU USE OR MAKE

# Fatigue Cracks

—BY A.H.DIX—

## Thumbs Up

••• Our mail man's legs are bowed like this ( ) under the weight of the orchids the Annual Number is drawing. The brains department's newest creation is meeting with unanimous huzzahs. We have never heard anyone say "Huzzah!" but we like the sound of it, so herewith a specimen huzzah:

'A new high in trade publishing has been definitely set that will be difficult to top by any publication.' Another with admirable restraint, calls it merely "absolutely magnificent."

If your yearning for an extra copy reaches 212 deg. F., please write as soon as you can, for the supply is melting fast. Price \$2.

## Most of Them Are Dull

••• Among the week's press releases are offerings from the American Social Hygiene Assn., a midwestern university, and Pontiac. Eeny, meenie, miny, moe, we'll take the middle one, which is based on an inventory of male students' pockets. The average student carries 50c., a comb, a handkerchief, four keys, and a meeting notice. Half carry matches, and one-quarter carry cigarettes.

The release ends with, "*Fewer than half had knives and most of them were dull.*" Maybe "dull" refers to knives, but if it means the students, they ought to carry pencils.

## Plated Pulchritude

*Always eager to put in a plug for the Copper and Brass Research Association, we pass along the report that an eccentric English artist, living in Nepal, whose beautiful wife died in her prime, copper-plated her and she is now a statue in his garden.*

## Pardon the Plural

In your recent tribute to your automotive editor, Bill Sherman, you referred to him as your "Detroit Gibbons." Did you mean Floyd or Mike?

We meant Edward Decline-and-Fall-of-the-Roman-Empire Gibbon. The sibilant slipped in by mistake. Sorry.

## Button, Button

••• The Gibbon of the future who weighs dispassionately the happenings of present century's hectic second quarter may devote at least a paragraph to the phenomenal rebirth of the celluloid button industry in the year just past. The presidential campaign started it, and we thought the election would finish it. But no. Jay O. Lashar, of the American Chain & Cable Co., designed a patriotic button bearing the head of Uncle Sam, with the wording, "I am proud he is my uncle." Sales have topped the million mark, and he is giving the royalties to the Red Cross.

## Singular Sentence

••• Among the gems in the Annual that were picked up and reprinted widely in the country's newspapers was the strike survey revealing that 11 million man-hours were lost since the defense program began as a result of strikes. Jim Rowan, our news editor, who made the survey, writes, "*Wages was the chief issue in most of the disputes.*"

The singular use of "wages" is found in the proverb,

"*The wages of sin is death,*" but "*My wages is \$24 a week*" sounds queer to us.

The dictionary calls it plural, but maybe the word is in process of change to the singular. The word "news" went through the same transition. A century ago a "new" was simply short for a "new happening" or occurrence. If nothing happened in a certain field the newspaper would report "There are no news this week."

## Cold Paper

••• Jim showed us the snowstorm of clippings from newspapers that quoted the Annual. Most of them were from newspapers unimaginatively named the *News*, *Observer*, *Times*, *Argus*, *Journal*, *Press*, *Post*, and so on. But one was from a Pennsylvania publisher gifted with originality. He calls his paper the *Oil City Blizzard*.

## Mrs. Miniver's Big End

The "big end" referred to in "Mrs. Miniver" is, of course, the big end of a connecting rod. According to my old British body-building manual a spring perch is a "dumb-iron," the cowl is the "scuttle," and some part of the seat frame that I cannot identify is a "squab."

A. W. Miller

## Slogans

••• We blow hot and cold in our attitude toward our slogan, "*The World's Greatest Industrial Paper.*" Even though it speaks but the simple truth there are times when our natural modesty gets out of control and we send the slogan into hibernation.

Then we get to reading the automobile ads, which convince us that modesty, like crime, does not pay, so we trot it out again. Our latest decision is reinforced by the fact that a small-town Indiana news correspondent has the courage to label himself "*A National Institution,*" a slogan also employed by the *Saturday Evening Post*.

Always on the lookout for something better, we keep an eye on the new slogans. Our favorites among the latest, as listed in *Printers' Ink*, are:

*Unaware of Underwear.* The P. H. Hanes Knitting Co.  
*She Shall Have Outlets Wherever She Goes.* (Wiremold "Plugmold" Assembly) Edward W. Robotham & Co.  
*Avoid Teeter-Totter Vitality.* Horlick's Malted Milk Corp.  
*Fit to the Tried.* Musebeck Shoe Co.  
*Get At That Corn Today—Forget that Ouch Tomorrow.* (Corn Salve) Kohler Manufacturing Co.  
*Prevent Schoolroom Slouch.* American Seating Co.  
*They're Tops for the Bottoms.* Musebeck Shoe Co.

## Literacy Test

Other such words which most people misspell . . . are: *liquefy*, *rarefy*, *naphtha*, *tranquillity*, and *supercede*. Try these on your friends. If they spell all these words correctly, their literary background must be quite broad.

—E. S. Rubin in "Industrial Marketing"

We did, and they were so dumb they thought the last word was spelled with two esses, and what is worse, they proved it.

## Puzzles

••• The Jan. 2 one about the bequeathed books is neatly unscrambled by Bill (National Credit Office) Stewart thus:

There being no irrelevant statements, deceased must have worn a green tie some place and some time. We know of only one place and one time, so he wore it at Oxford in March, 1920.

Ownership of the umbrella can be established only if the first legatee did lend it, which very neatly puts Smith in his place.

Smith, having seen deceased wear that tie, cannot choose before Jones. So Jones cannot choose last, nor can he choose second if the final statement is to be relevant. Brown must choose before someone, so poor Smith was first in love and last in books. Jones, Brown and Smith is the order, but did Jones get his umbrella back?

The whole thing, including the umbrella, is over our head. We like easy ones like this:

*How long will it take a clock to strike ten, if it takes seven seconds to strike seven?*



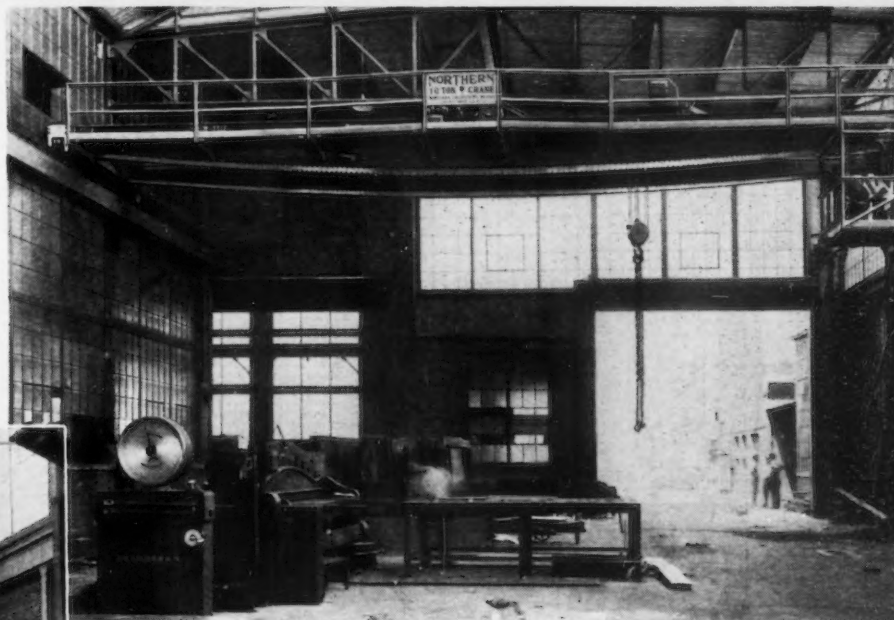


Northern Cranes handle all material in the storage yard of this steel mill.

# *Northern* SUPER-CRANES SERVE A WIDE RANGE OF INDUSTRIES

Speed, fine control, excess capacity, exceptional durability, make these Northern Super-Cranes particularly valuable where service is heavy and continuous.

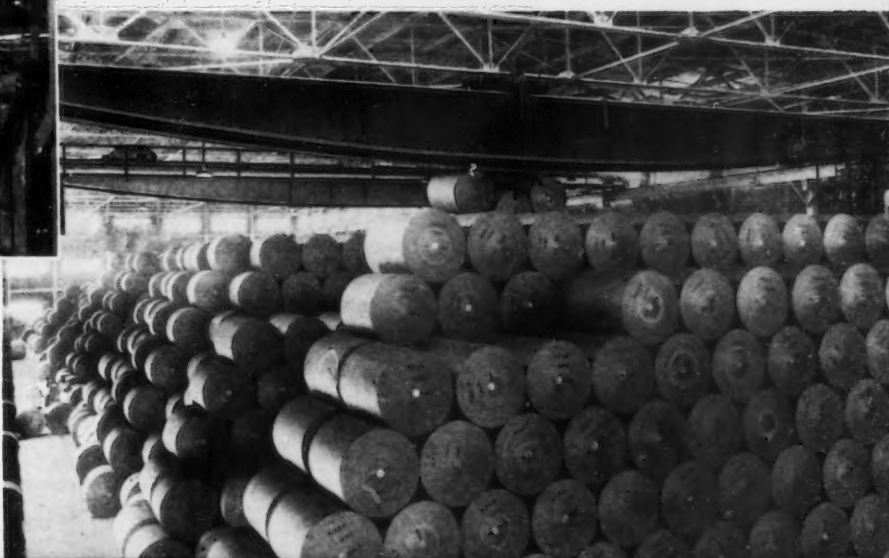
Northern quality assures continuous operation.



Handling plate storage in the warehouse of one of the largest steel fabricators.



Machine room crane in one of the large southern paper mills.



Northern Cranes handle all paper stored in this warehouse.

**NORTHERN ENGINEERING WORKS**  
2607 Atwater Street  
Detroit, Michigan

# News of Industry...

## Scrap Trade to Aid Government In Stabilization of Prices

Leon Henderson, commissioner in charge of the Price Stabilization Division of the National Defense Advisory Commission, in speaking to 600 members of the Institute of Scrap and Steel at their annual meeting in Baltimore last week, made it unmistakably plain that some form of government control of prices and possibly allocation of supplies of scrap may be resorted to if the scrap industry through voluntary action does not hold prices at a reasonable level.

Only two days before he talked to the scrap dealers Mr. Henderson had issued a statement in



LEON HENDERSON: "It would be a horrible perversion of democratic principles if the only way we could meet our present situation is by increasing the stringency of government control over individual business."

Washington in which a price objective of \$20 a ton for No. 1 heavy melting steel at Pittsburgh was mentioned. It was inferred from his remarks that Mr. Henderson did not expect that prices could be immediately reduced to that level but that the upward trend should be reversed and that the industry should so govern its actions with regard to prices that a continuously upward spiral would be avoided.

Saying that he was not satisfied with the course of prices since last October, when the first price stabilization meeting was held in Washington with representatives of the scrap trade, Mr. Henderson said that he was not advocating that prices shall remain static, but that such fluctuations as might occur in the normal course of business shall be kept within limits and that prices be prevented from soaring.

"We may have to come to some sort of syndicalism, but we are not going to do it if we can prevent runaway prices in any other way," said Mr. Henderson. "We may have to do a lot of things in order to prevent scrap prices and other prices from getting too far out of line." He said that several plans had been considered for adoption in the event that more stringent methods are required to control the price situation. He emphasized, however, that the Price Stabilization Division is not a price control division. He said that the government does not want to attempt to exercise rigid control of prices and that it is not opposed to fair prices and fair profits. He saw no advantages to be derived from rigid price control and many disadvantages, but he said that there is no justification for the rise that has recently taken place in scrap prices.

Citing the efforts which the defense commission is making to

keep all commodity prices from getting out of hand, Mr. Henderson pointed to the economic importance of keeping to a reasonably low price level, particularly in the readjustment which must follow the end of the war. He said that the strongest weapon the United States can have in the post-war adjustment will be a low price level. He pointed out that the budget which President Roosevelt recently presented to Congress would have had to be about \$9,000,000,000 higher if the high price level of the first World War were now in effect.

As to just what form of government control might be exercised if scrap prices are not kept in line by the voluntary action of the industry, Mr. Henderson did not say, but in answer to questions



W. L. BATT: "I think there is going to be a larger demand for steel in 1941 than in 1940, but I am not ready to say how much more because I don't know what people are going to be allowed to do with their money after they get it."



after his talk he admitted that the government could take over the large tonnages supplied to the market by the railroads, the automobile industry and other important producers and allocate these to consumers. He warned that scrap brokers might find themselves useless in scrap distribution if such a situation were permitted to come to pass. He said he wants to see the present system work. He admitted, upon being questioned, that he saw no reason why the established price differentials as between districts and between grades should not be permitted according to the established practices of the trade.

All that the government wants, he said, is a strong virile system that will produce a sufficient supply of scrap at reasonable prices. It was stated that at least 4,000,000 tons, perhaps as much as 5,000,000 tons, more scrap than was bought in the open market in 1940 may be needed this year to supply the mills and foundries.

Ending with an appeal to the patriotism of the scrap trade, he said that he feels "it would be a horrible perversion of democratic principles if the only way we could meet our present situation is by increasing the stringency of government control over individual business."

**W. L. Batt**, deputy commissioner of the Industrial Materials Division of the National Defense Commission, also discussed the price and supply situation as the commission finds it.

"This country is built on steel, as is no other country in the world, and of course steel depends on iron and steel scrap," he said. "So it is no exaggeration to say that the defense program, which first means guns, tanks, airplanes, and, second, a strong civilian economy, very directly rests on the business which you scrap men represent."

Mr. Batt said he was entirely in sympathy in what Mr. Henderson is trying to do in the matter of price stabilization. "You will remember," he said, "that during the last war the cost of living more than doubled, the price index doubled, wages almost doubled. One of the objectives which the commission has had, and quite unanimously, — I think perhaps



**G. L. RATHEL:** "It is physically impossible for the steel companies to absorb increased tax and labor costs, plus increased scrap prices, unless they increase their own prices on finished goods."

the most unanimous of any single thing upon which the commission has had an opportunity for a division of opinion—has been this one thing: That we were going to try to do everything we could to

persuade private enterprise that prices ought to stay down.

"It is easy to suggest that the government put a ceiling on prices. That could be done. But I would like to have somebody have the job, because when you start putting a ceiling on one price you can see that it goes on like a fire in a gasoline tank. If you put a ceiling on this one, you immediately have to put a ceiling on that one and then on labor and on dividends. So far as I can see, the minute you start with a ceiling on prices of any particular commodity you are likely to face price control all down the line.

"What I want to emphasize is that the commission is a unit in its determination to try to persuade private enterprise to keep prices down. In that effort we will have to do things that are unpleasant and perhaps unwise about which there will be a wide difference of opinion.

"Whether or not an increase in prices brings out more material is open to argument, but it is our measured opinion, and I find it is the opinion of a great many men whom I believe are the most thoughtful in this group, that rising prices will not necessarily bring out more material in this field. Certainly we do not want to dry up, by any policy which may be suggested, the sources of supply because we shall need more scrap, not less.

"I do not know how much steel is going to be required because I do not know how some of the present social forces are going to work out. There are a good many million people out of work today. I don't know how many of these are really employable. But if one assumes, as I am willing to, that there are perhaps 5,000,000 people unemployed, then the question to ask is whether there will be work enough to put all of them or any large part of them back into employment. My answer is that I think there will be. It may be civilian reemployment. It may be defense reemployment. I believe a good part of it is going to be civilian reemployment because in our industrial plants men are carrying home bigger pay envelopes than they have ever carried home and they want to spend that

### Coming Events

Jan. 17 to 18—National Slag Association, annual meeting, Birmingham, Ala.

Jan. 27 to 30 — American Road Builders Association, annual convention and show, New York.

Feb. 7 to 8—Iron, Steel and Allied Industries, annual conference, Del Monte, Cal.

March 25 to 29—American Society of Tool Engineers, Machine and Tool Progress Exhibit, Detroit.

April 16 to 18—Electrochemical Society, Inc., spring meeting, Cleveland.

April 23 to 25—Concrete Reinforcing Steel Institute, annual meeting, Hot Springs, Va.

May 5 to 7—American Gear Manufacturers Association, annual convention, Hot Springs, Va.

May 12 to 15 — American Foundrymen's Association, annual meeting, New York.

# Soldiers

## All

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11 0000  
000 00



Washington Navy Yard  
Arsenal workmen do  
their part in spurring a  
lagging defense pro-  
gram. (A Defense Com-  
mission Photo)



money. They want to buy refrigerators, automobiles — all the things that people want to buy when they have money.

"As men want to spend that money I think we are going to need steel to go into things they would like to buy. So I think there is going to be a larger demand for steel in 1941 than in 1940. But I am not ready to say how much more may be required because I don't know what people are going to be allowed to do with their money after they get it. It could happen that we may tax everything away from the individual so that he will have no incentive to buy refrigerators and automobiles. I don't believe that is going to happen, but it indicates that it is difficult to say how much steel and how much ore and how much scrap will be required in 1941.

"A great many people have felt that the operation of priorities would take care of the situation; that where there was not enough material to go around the priorities system would simply step in and shift materials from civilian use to the Army and Navy and the British. I think that will happen when we have full reemployment. Of course in some instances it must happen before that."

Mr. Batt referred to the situation in zinc, explaining that until new capacity is brought into operation civilian demands must wait until the needs of the defense program and Britain have been satisfied.

He said he did not believe that the powers to draft industry would ever have to be used. But the power is there, he added, and will be applied if necessary. He said that the American people would be intolerant of strikes in defense industries, "but they will be equally intolerant of careless management if it contributes to a strike situation."

Right or wrong, it is the conviction of the defense commission that higher and higher prices do not bring out more scrap. He made an appeal against hoarding of scrap as being unpatriotic.

A plan for joint control of the scrap supply and price situation by the steel industry and the scrap industry, should such a step be necessary, was outlined by G. L.

### **Louis J. Borinstein New Head of Scrap Institute**

Chicago was selected for the 1942 meeting and the following officers were elected:

President—Louis J. Borinstein, Indianapolis.

Vice-president — Philip W. Frieder, Cleveland.

Secretary—George L. Sturm, Middletown, Ohio.

Treasurer—Everett B. Michaels, Chicago.

New directors at large—Joseph E. Jackson, Pittsburgh, and Philip W. Frieder, Cleveland.

Rathel, vice-president of the Continental Steel Corp., Kokomo, Ind., a company which consumes 300,000 tons of steel scrap a year. Mr. Rathel advocated a joint board consisting of five representatives of the steel industry and five representatives of the scrap industry to be headed by an impartial chairman, this committee to control and allocate supplies of scrap in cooperation with the Washington authorities.

Mr. Rathel discussed the relation between buyers and sellers of scrap, dealing with such questions as specifications, preparation of scrap, direct buying, and other subjects about which there have been controversies affecting the relationships between the mills and the scrap trade. On the question of prices, he said, "It is physically impossible for the steel companies to absorb increased tax and labor costs, plus increased scrap prices unless they increase their own prices on finished goods. This the government does not want. If steel prices are increased, it means additional costs in our rearmament program and an increase on all finished steel products used by the consumer. To you men of the Institute of Scrap Iron and Steel and to all who are engaged in the business of gathering and selling scrap, let me say that you are faced with a duty involving patriotism as well as other very definite responsibilities.

"I realize we are passing through a period that is trying the courage and resourcefulness of all business men. Our government has accepted the challenge of those remorseless leaders of other coun-

tries who do not believe in our way of living. We have started on this great rearmament program and if it is to be carried through on an efficient and successful basis, consumers and suppliers alike must translate their responsibilities into a real service. They must not hesitate to make any sacrifice for the general welfare of our country."

Mr. Rathel declared his opposition to direct buying of scrap by the steel mills on the ground that it disrupts markets, affects normal distribution, and has a tendency to create great fluctuations. "If the scrap dealer is expected and encouraged to make tremendous investments in yards and equipment and in building up and training organizations for serving the consumers, then certainly it is not fair for the consumer to offer competition to his supplier."

In order to work more closely with the government in the procurement of adequate supplies of scrap the institute will soon move its executive offices to Washington, where E. C. Barringer, national executive secretary, will make his headquarters for the duration of the emergency. Chapter presidents, addressing the convention, gave assurance of heartiest support of the defense program, asserting that they would do everything possible to prevent hoarding of scrap.

As proof of its patriotic zeal and sympathy for Great Britain, the institute voted to donate 20 ambulances to the British, one for each chapter.

The retiring president, Joseph E. Jacobson of Luria Brothers & Co., Pittsburgh, voiced the sentiment that seemed to prevail throughout the meeting when he said:

"Either we as an industry must learn to function smoothly as the handmaiden of the steel industry and serve it with scrap that is its vital food in quantities as large as we can gather with every means at our command or we must relinquish control of our own industry. We will have government cooperation to do these things, and either we will do them as individuals and through our institute or I predict to you that we will force the other alternative into being—the government will

pass laws and set up instruments to do these things itself with or without our cooperation.

"Let us avoid speculation and be satisfied with fair profits, let us not hoard or hold scrap, and again and above all avoid buying and holding scrap for higher than current market prices. We are a vital part of the defense picture. Our performance is carefully scrutinized at Washington and we are very much in the public eye and not too high in public favor at this moment. Our government understands our problems and is anxious to help us. We cannot refuse to grasp that hand in cooperation because if we do not it will not be offered again in the same way."

In an appeal for patriotic action, Mr. Jacobson significantly said: "Were it not for this government every man in this room is one with the hopeless, driven, starved refugees in war-torn Europe. Let every man in this room realize this for his own good and here highly resolve to so conduct his activities and his thinking so that this government will grow stronger and eventually triumph completely over insidious propaganda and every enemy seen or unseen."

E. C. Barringer, national executive secretary, reported a total membership of about 700, divided into 20 chapters, and a steady improvement in the institute's financial status. He praised the trade press for its "fair treatment of our industry and the reporting of our activities and our markets."

Other speakers were S. Wells

Utley of the Detroit Steel Casting Co., Detroit, who discussed "What Industry Means to Civilization," and Samuel G. Keywell of the Samuel G. Keywell Co., Detroit, whose subject was "Changing Trends in Scrap Production."

### Foster Machine Co. Buys Lathe Concern

Elkhart, Ind.

• • • Foster Machine Co. has purchased all assets of the International Machine Tool Co., manufacturers of lathes. At the same time it was announced that C. Russell Feldman, New York, and E. H. Welker, Detroit, acquired a majority interest in the Foster concern, while W. H. Foster, founder of the firm, will continue to be active in its management.

**SPACE FOR DRAFTSMAN:** With drafting room efficiency a contributing factor towards speedy completion of national defense projects, Pittsburgh Des Moines Steel Co., Pittsburgh, has recently completed a modern and up-to-date drafting room with a capacity for 40 draftsmen. The three exterior walls shown above are almost completely made of glass block, the window area being about 0.703 sq. ft. per sq. ft. of floor space. The room is illuminated with 51 80-watt fluorescent lamps which consume approximately 3.45 watts per sq. ft. of floor space.

### Export Licensing System Broadens

Washington

• • • The export licensing control system was broadened last week to include copper, brass, bronze, zinc, nickel and potash. Necessity for the move was attributed by President Roosevelt to "the accelerating needs" of the defense program. The proclamation becomes effective Feb. 3, after which all exports of the products covered will be prohibited unless a license has been issued by the State Department's division of controls.

Simultaneously with the announcement at the White House on Jan. 10, the State Department released the text of the proclamation, the executive order, and an interpretation of the articles and materials included under the order. Using the Commerce Department's statistical classification of domestic commodities exported, the regulations listed the commodity numbers of 12 classifications of copper; eight of brass and bronze; seven of zinc; five of nickel and two of potash.

### \$16 Million in Defense Orders for Milwaukee

• • • With a total of \$31,556,000 in ship and submarine contracts, Manitowoc led Wisconsin cities in defense contracts received through the middle of November. Milwaukee got over \$16,000,000, Racine over \$5,000,000 and Beloit over \$4,000,000.





## Analysis of 1939 Operations of Eight Machine Tool Builders

••• The machine tool manufacturers whose financial reports are combined in Table I represent eight of the more important concerns in this industry from the standpoint of investment, value of goods sold and number of workers employed. Their sales accounted for approximately 36 per cent of total sales of the machine tool industry. The combined net income, before deduction of interest on long term borrowings and income taxes, on an average total capital of \$77,107,734 employed in 1939, was \$14,021,790, or a rate of return of 18.2 per cent. Individual rates of return ranged from a loss of 0.01 per cent to a profit of 31.6 per cent. After deducting fixed charges and income tax, the net income was \$10,999,718 or a rate of return of 14.6 per cent of the stockholder's investment. Cash dividends paid during 1939 represented a return of slightly over 8.8 per cent to the stockholders.

In Table II is shown a more detailed analysis of the principal elements of cost and expenses of six of the eight machine tool manufacturing corporations. Two of the builders indicated that their accounting systems were not designed to segregate these elements of cost.

These data are taken from a report on Machine Tool Manufacturing Corporations, issued Dec. 31, 1940, by the Federal Trade Commission, Washington.

### Yates-American Machine Co. Formed by 4 Companies

Beloit, Wis.

••• Yates-American Machine Co. is the name of a new consolidation of the Yates-American Co., this city, and its affiliates, General Refrigeration Corp., South Beloit; New York Lipman Co., New York; P. B. Yates Machine Co., Ltd., Hamilton, Ont. Directors elected Alvin Haas, Beloit, former vice-president and general manager of Yates-American, as president of the consolidated corporation. In addition to being large manufacturers of woodworking machinery, the companies are developing commercial refrigeration, air conditioning and heat transfer units.

### MACHINE TOOL MANUFACTURING CORPORATIONS

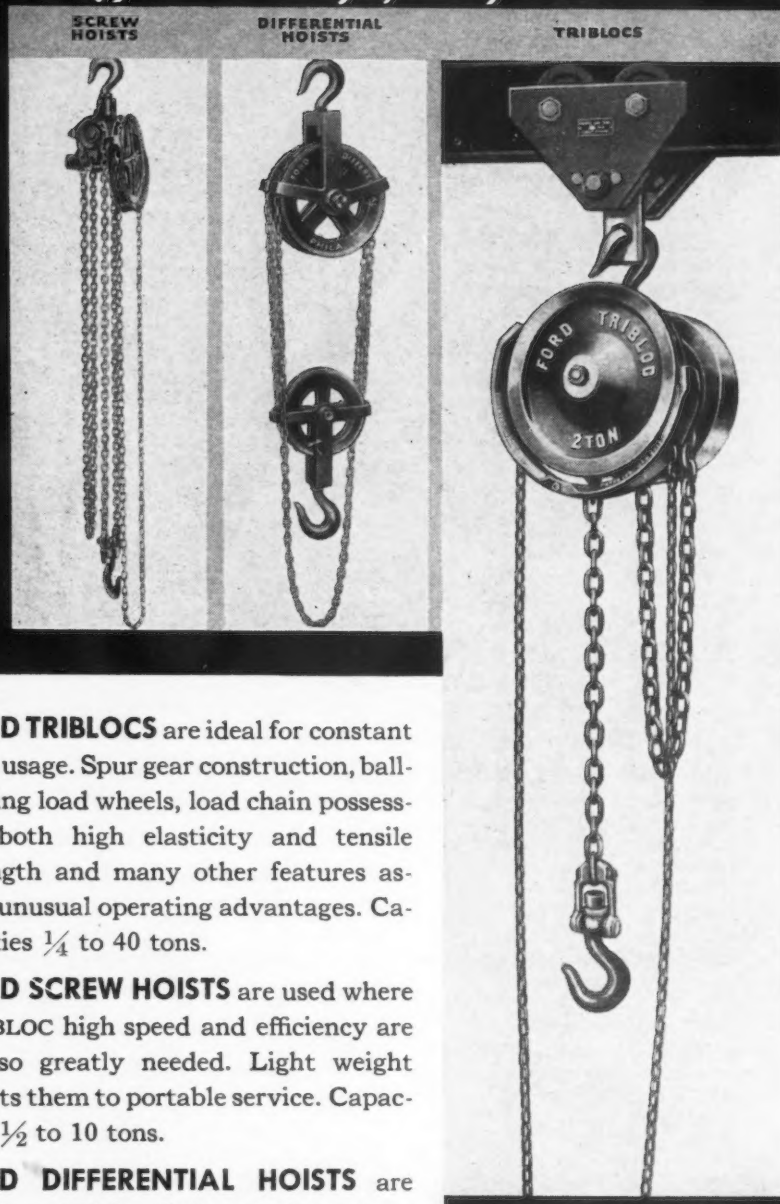
Table I—Combined Income and Expense Statement of Eight Machine Tool Builders

Items of Income and Expense	1939	Ratios or Cents Per Dollar of Sales
Sales—(less discounts, returns and allowances) .....	\$79,045,896	100.00
Cost of goods sold: (Exclusive of items set forth below as "Expenses") .....	54,290,597	68.68
Gross margin on sales .....	24,755,299	31.32
Other operating revenue or loss .....	117,747	0.15
Total gross revenue .....	24,873,046	31.47
<b>EXPENSES</b>		
Selling expenses .....	\$5,707,195	7.22
Advertising .....	726,574	0.92
Administrative and general office .....	2,698,153	3.41
All taxes (except income taxes and social security payments) .....	802,156	1.02
All social security and pension fund payments .....	856,002	1.08
Research and development expense .....	343,617	0.44
Total expenses .....	11,133,697	14.09
Provision for uncollectible accounts .....	64,639	0.08
Total expenses and uncollectible accounts .....	11,198,336	14.17
Net profit from manufacturing and trading .....	13,674,710	17.30
<b>OTHER INCOME</b>		
Income from investments .....	\$153,534	...
Interest on receivables .....	42,873	...
Discount on purchases .....	140,667	...
Sundries .....	145,211	...
Total other income .....	482,285	...
Net profit from manufacturing plus other income .....	14,156,995	...
<b>OTHER EXPENSES AND DEDUCTIONS</b>		
Interest expenses (other than long-term debt) .....	\$29,753	...
Idle plant expense .....	74,322	...
Sundry .....	31,130	...
Total other expenses and deductions .....	135,205	...
Net income before interest on long-term debt .....	14,021,790	...
Interest on long-term debt .....	52,063	...
Net income before income taxes .....	13,969,727	...
All income taxes—deduct .....	2,970,009	...
Net income after income taxes .....	10,999,718	...

Table II—Supplemental Statement to the Income and Expense Statement of Six Machine Tool Builders

Items of Income and Expense	1939	Ratios or Cents Per Dollar of Sales
Sales—domestic (less discounts, returns and allowances) .....	\$41,165,871	79.95
Sales—export and foreign (less discounts, returns and allowances) .....	10,326,243	20.05
Total sales .....	51,492,114	100.00
Cost of goods sold: (Exclusive of items set forth below as "Expenses") .....		
Materials cost—direct .....	\$14,982,898	29.10
Production wages and salaries .....	12,315,174	23.92
Other costs and expenses not listed below under "Expenses" .....	6,418,240	12.46
Depreciation and obsolescence—plant facilities .....	1,648,068	3.20
Finished goods purchased for resale .....	.....	.....
Total .....	35,364,380	68.68
Gross margin on sales .....	16,127,734	31.32
Other operating revenue or loss .....	67,212	0.13
Total gross revenue .....	16,194,946	31.45
<b>EXPENSES</b>		
Selling expenses .....	\$4,520,331	8.78
Advertising .....	449,848	0.87
Administrative and general office .....	2,032,777	3.95
All taxes (except income taxes and social security payments) .....	668,949	1.30
All social security and pension fund payments .....	656,043	1.27
Research and development expense .....	335,408	0.65
Total .....	8,663,356	16.82
Provision for uncollectible accounts .....	44,639	0.09
Total expenses and uncollectible accounts .....	8,707,995	16.91
Net profit from manufacturing and trading .....	7,486,951	14.54

## There is a **FORD** **HOIST and TROLLEY** *for every purpose*



**FORD TRIBLOCS** are ideal for constant hard usage. Spur gear construction, ball-bearing load wheels, load chain possessing both high elasticity and tensile strength and many other features assure unusual operating advantages. Capacities  $\frac{1}{4}$  to 40 tons.

**FORD SCREW HOISTS** are used where TRIBLOC high speed and efficiency are not so greatly needed. Light weight adapts them to portable service. Capacities  $\frac{1}{2}$  to 10 tons.

**FORD DIFFERENTIAL HOISTS** are constructed for light service where speed, portability and price count. Capacities  $\frac{1}{4}$  to 2 tons.

**FORD TROLLEYS** with Timken roller bearings and many other quality features are made in plain and geared models ranging in capacity from  $\frac{1}{4}$  to 40 tons.

*Order from your distributor*

**FORD CHAIN BLOCK DIVISION**  
PHILADELPHIA, PENNSYLVANIA



**AMERICAN CHAIN & CABLE  
COMPANY, Inc.**

*In Business for Your Safety*

## On the Assembly Line

(CONTINUED FROM PAGE 52)

eties of storage batteries from 29 to five; spark plugs and generators from eight to two; and fan belts from 21 to three.

The all-wheel drive truck has proved essential to modern warfare, Gen. Gregory said, and is now being used for all tactical equipment.

On exhibit, right along side the SAE-QMC standardized parts, was a new type of steering gear for military vehicles which permits both back and front wheels to steer simultaneously. This has already been applied to eight of the Bantam cars and one midget Willys. This gear, manufactured and exhibited by Ross Gear and Tool Co., Lafayette, Ind., is a cam and lever type.

The steering gear ratio is variable for both front and rear wheels. In operation, the front wheels change their angle more rapidly at the start of the turn than the rear wheels do to provide for steadiness of control in the straight-ahead steering position. As the sharpness of the turn is increased, the back wheels turn more quickly. The turning diameter of the Bantam cars with this gear is 18 ft.—which is less than three times the wheelbase of the car (80 in.). Real purpose of this type of steering is to increase maneuverability—instances where the midget trucks were operated at high speeds in the woods were cited.

In addition to the Bantams, the Army displayed pictures of a Crosley tricycle (labeled a 3 x 2 because it has three wheels, two of which are power driven). So far there has been no announcement about this type of vehicle which is essentially a motor cycle with two rear wheels and with seats atop a box. It is very similar to the motorcycles being used commercially for messenger service.

Army and Navy speakers on the program took occasion to stress the fact that the government is counting heavily on the automobile industry for automotive equipment and as a potential supplier of aircraft. On this point, Gen. Gregory commented, "There has been talk of lack of steam in the national defense program, but it is not directed toward the automotive industry."

Among the speakers highlighted



## INDUSTRY

during the week was Sir Louis Beale of the British Purchasing Commission, who addressed the annual banquet meeting. His estimate of steel capacity of the warring nations was indeed revealing. At the start of the war, he said, the Allied and Nazi steel capacities were approximately 23,000,000 ingot tons each. Now German capacity is 40,000,000 tons, while England's has been reduced to 14,000,000 ingot tons.

"Despite the bombings," Sir Louis said, "industrial production for all war purposes proceeds apace throughout Britain. A notable example is aircraft production, which, by the whole-time use of every machine tool in the country—indeed every machine tool in Britain is in whole-time use—keeps up a full and continuous production. To secure victory, the whole of the machine production of democracy must be thrown against the totalitarian onslaught. Thrown with all our might—now."

Somewhat grim as was the whole week of meetings so largely devoted to military matters, Sir Louis' appearance was preceded by an introduction which stressed the fact that his words would be guarded because he believes the international spy situation called for extreme caution. However, a ludicrous note cropped up during the week when an SAE official went out in front of the hotel to take a picture of the Army exhibit which the SAE had arranged for the occasion. He and his photographer were "arrested" but released shortly with some red-faced apologies. Picture-taking was permitted with the understanding that cameras must be kept 25 ft. or more from the objects, a restriction hard to understand in these days of the amateur enlarger and telephoto lens.

Incidentally, the downtown exhibit was paralleled by one at the General Motors Building where an impressive display of military vehicles was staged by General Motors. Here again photographers had a field day.

Defense requirements and heavy normal requirements have increased the tendency to long range buying in Detroit, according to the Purchasing Agents Association. Ninety-one per cent of all buying in the area is for requirements three to nine months ahead with a heavy

# Happy New Year. 1816



To the young Swiss watchmaker, 1816 was a happy new year.

Dissatisfied with prospects in his native Switzerland, he had struck out for America 16 years before. Now, as he eyed his shiny new shingle, he felt proud—proud of the America that had given him the opportunity he sought.

He was cheerful...despite dark days, for the War of 1812 had left the legacy of every war—bad times. His own faith unshaken, the young watchmaker nailed up his sign and went to work.

Since then, we, the Company he founded, have kept his faith through some 15 depressions and 4 wars. Today, we roll up our sleeves once more—again to share in the defense of the Nation.

Smiling, we bend to the task—knowing full well that this is not the first threat to our liberty...nor will it be the first to have shattered itself against the free will of a free people.

Knowing, as the watchmaker knew, that in the freedom of her people lies America's shield and strength, and our guarantee of a happy new year...forever.

**Peter A. FRASSE and Co., Inc.**

1816-1941 125<sup>th</sup> ANNIVERSARY





I USE 3,000 A DAY

I USE 300 A DAY

**We Both Profit  
by Insisting On  
PARKER-KALON  
Cold-forged Products**

**B**ECAUSE Parker-Kalon Cold-forged Socket Screws, Wing Nuts, Cap Nuts and Thumb Screws are made to such exacting standards, both small users and large enjoy the benefits that come with accuracy, strength, good design and fine finish. No wonder, then, that so many thousands have standardized on Parker-Kalon. Samples and prices are yours for the asking. Write.

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**PARKER-KALON**  
*Cold-forged*  
SOCKET SCREWS WING NUTS  
CAP NUTS THUMB SCREWS  
SOLD ONLY THROUGH REPUTABLE DISTRIBUTORS

concentration (55 per cent) in the three-month range and 35 per cent in the six-month range. Hand-to-mouth buying has disappeared entirely, reaching the zero point for the first time since August, 1937.

#### Auto Production Rebounds

Automobile production rebounded in the past week but did not reach pre-holiday levels, which were approximately 125,000 per week. Assemblies totaled 115,395 for the week ended Jan. 10, compared with 76,690 in the previous week and 111,330 in the corresponding week of last year, according to Ward's Automotive Reports.

#### Metallurgists Needed For National Defense Program

Washington

• • • The United States Civil Service Commission has announced that it will again receive applications for positions of metallurgist and metallurgical engineer, various grades, with salaries ranging from \$5,600 to \$3,200 a year. An insufficient number of eligibles for filling these positions resulted from the examination which closed in September, 1940. Difficulty is being encountered in filling positions in the Bureau of Mines in connection with the national defense program for the development of strategic metals. Qualified persons are urged to send their applications to the commission's Washington office at once where they will be rated as received until Dec. 31, 1941.

#### Van Norman Offers Stock At \$15.25 a Share

• • • Van Norman Machine Tool Co., Springfield, Mass., on Jan. 9 offered 62,342 shares of its stock to the public at \$15.25 per share. Proceeds of the issue will be used in part to redeem \$540,000 of the company's 3¾ per cent serial notes, due 1941-49, and the balance will be used for additional working capital. The company reported a backlog of orders on Nov. 30 in excess of \$2,000,000, of which approximately 20 per cent represented orders from the British, the rest being domestic business.

#### Manganese Ore Imports In November 56,738 Tons

Washington

• • • Domestic production of manganese ore containing 35 per cent or more manganese last November was 2400 gross tons, shipments were 2300 tons and producers' stocks at the end of the month were 2400 tons, according to the Bureau of Mines. These figures are predicated on reports received from producers that accounted for 87 per cent of the total in 1939.

The manganese ore industry of the United States produced 47,700 long tons of merchantable manganese ore in 1939, according to preliminary figures released by William Lane Austin, Director of the Census. This production, about three-fourths of which was concentrates, included over 7900 tons of ferrograde manganese concentrates. Such material, containing a minimum of 48 per cent manganese (natural) is suitable for the manufacture of 78 to 80 per cent ferromanganese, the alloy used in the manufacture of steel.

Imports of metallurgical manganese ore in November, 1940, totaled 56,738 tons manganese content according to the Bureau of Foreign and Domestic Commerce.

Imports in gross tons by countries follow:

Country	Imports for Consumption <sup>1</sup> Manganese Content	General Imports <sup>2</sup> Manganese Content
Belgian Congo . . .	485	485
Brazil . . . . .	7,840	4,280
Chile . . . . .	494	494
Cuba . . . . .	10,508	10,508
Gold Coast . . . . .	18,024	9,377
India, British . . . . .	13,750	20,473
Mexico . . . . .	52	52
Netherlands Indies . . . . .	228	228
Philippine Islands . . . . .	1,800	1,800
Union of S. Africa . . . . .	6,386	9,041
U.S.S.R. . . . .	1,152	....
	59,740	56,738

<sup>1</sup> Comprises ore withdrawn from bonded warehouses, irrespective of the month of importation, and ore received in this country during November for immediate consumption.

<sup>2</sup> Comprises ore received in this country during November, of which part went into immediate consumption and the remainder entered bonded warehouses.

#### 137 Underground Ammunition Magazines to be Built Savanna, Ill.

• • • Construction of 137 additional underground magazines for storage of ammunition at the ordnance depot here has been authorized. Work will start early in the spring.



## Welding 70,000

### Tensile Steel

(CONCLUDED FROM PAGE 35)

or other similar grades, keeping some heat in the vicinity of the joint is beneficial. It is also desirable for tensile strength steels higher than 70,000. Preheating is not recommended as a cure-all, but whenever some trouble is encountered in welding, the source of which may be difficult to find, the first attempt at correcting the difficulty should be the introduction of some heat into the vessel.

The 70,000 tensile grade is not limited to the carbon-silicon steels of A.S.M.E. S-55 specification but may include other acceptable materials in accordance with ASME Boiler Code and ASTM specifications, such as the following:

ASME S-28 (ASTM A202-37T) chrome — manganese — silicon grade A).

ASME S-43 (ASTM A203-37T) low-carbon nickel steel.

ASME S-44 (ASTM A204-37-T) molybdenum steel.

The electrode manufacturers have welding rods available for all of these steels which will produce physical properties in the deposited weld metal equal to that of the plate, with similar analysis as well.

The S-55 steels are being welded by hand, semi-automatic and automatic methods of fusion welding for pressure vessels and boiler drums. These steels are being applied to other fields also, as the saving in weight of weldments and ease of fabrication of the material combined with good machined finishes are attractive to fabricator and user alike.

#### Timken Installs New Heavy Forging Equipment

••• A 1000-ton hydraulic press and two steam hammers are a part of the new equipment being installed in the Timken Roller Bearing Co.'s new forge shop at Canton, Ohio. This press will make possible the quick disposition of small orders which would otherwise hold up large orders on the blooming mill.



## LOOKING FOR *Performance?*

### GET ACQUAINTED WITH THIS STEEL GROUP!

ELASTUF Machinery Steels were introduced in 1921. Since then a host of users have learned to depend on them because of their ability to perform in service.

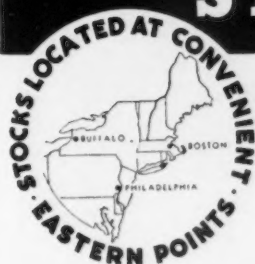
In replacing broken armature shafts on trolley cars, an ELASTUF Steel has yielded 100% perfect service for the past 10 years—where other steels constantly failed. In small racks on tin cap assembly lines, where wear and strain caused daily break-downs, an ELASTUF Steel has worked many months without failure. Case after case is proving that these steels have what it takes to **PERFORM**.

#### 7 OTHER REASONS THAT RECOMMEND ELASTUF STEELS TO YOU.

1. Known physicals.
2. Selection without guesswork.
3. Machinable in ready-for-use condition, eliminating heat treatment.
4. A single related group covering all machinery steel uses.
5. Consistent uniformity through controlled production.
6. No premium in cost.
7. Always available at nearby points.

These busy days leave no time for second guesses. To pick the right steel the first time we offer you a Machinery Steel Selector—a handy tool showing ready-for-use physical properties in all available sizes of related ELASTUF Steels. Use your Selector or get in touch with the nearest associated distributor listed below.

## ELASTUF STEELS



BEALS-McCARTHY & ROGERS • BUFFALO-ROCHESTER  
BROWN-WALES CO. • BOSTON, MASS.-LEWISTON, ME.  
HORACE T. POTTS CO. • PHILADELPHIA-BALTIMORE

**Selector Ends Guesswork**  
By giving steel data in terms of ready-for-use physicals, the Machinery Steel Selector enables you to pick the right steel in any size up to 8" without guesswork. Use your Selector—for another one, write the nearest point listed below.



**PERFORATED METALS**

**INDUSTRIAL and ORNAMENTAL**

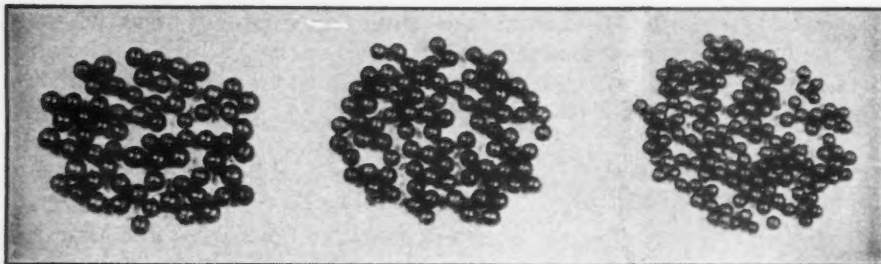
To produce the highest quality of perforated metal as used in the industrial arts and for ornamentation has been the ambition and persistent endeavor of this company. The highest quality best serves the user. We are here to serve you.

ANY METAL • ANY PERFORATION

**The Harrington & King Co.**  
PERFORATING

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New York Office, 114 Liberty Street



HEAT-TREATED STEEL SHOT

## We manufacture shot and grit for endurance

A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our—

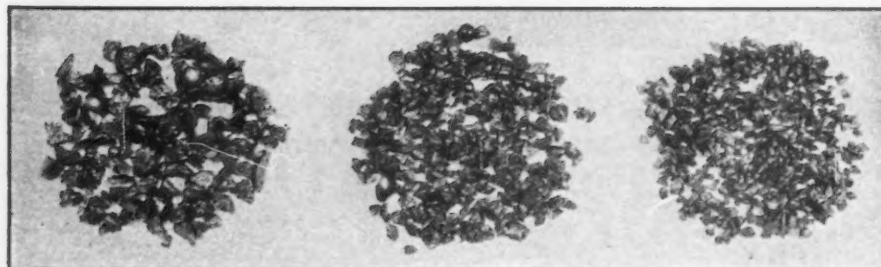
### Heat-Treated Steel Shot and Heat-Treated Steel Grit

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.

**HARRISON ABRASIVE CORPORATION**

MANCHESTER, NEW HAMPSHIRE

HEAT-TREATED STEEL GRIT



## Chrysler Army Tank Plant Being Built on Schedule

Washington

• • • Heavy snow storms and low temperatures have failed to retard progress on the construction of the tank arsenal being built by the Chrysler Corp. at Detroit, Secretary of War Stimson has said.

The arsenal, the largest of its type in the world, will be 1380 ft. long and 500 ft. wide, and is expected to cost \$20,000,000. The War Department already has placed an order for 1000 25-ton tanks at an estimated cost of \$33,500,000. Production is expected to start early in the fall of 1941 at the rate of five tanks per day per shift.

## Republic Armor Plate Mill to Operate Soon

Massillon, Ohio

• • • The new mill for production of light armor plate which Republic Steel Corp. is installing will go into partial operation soon. It will absorb three sheet mill buildings having a total of nearly 300,000 sq. ft. of floor space. The corporation will begin immediately to install equipment for heat treating and cutting, finishing and shaping armor plate. The ultimate capacity of the plant will be reached by late summer.

The first installation will consist of 18 new heating furnaces to supplement existing furnaces, presses for straightening the armor plate after it has been heat treated, and equipment for shaping it.

Electric furnace steel for the armor plate mill will be produced in Republic's Canton plant.

## CIO Says Properly Used Steel Plants Could Lift Output

Washington

• • • It is reported that CIO President Philip Murray soon will lay before President Roosevelt a SWOC survey designed to show that there is no need for increasing steel ingot capacity but that existing facilities if properly used could in 1941 produce 30 per cent more steel than was made in 1940.



## Reich Trade Balance Over Italy Grows

Washington

••• The Commerce Department reports that German industrial activity in October and November still centered on the production of war equipment and accessory materials. Emphasis has been placed on industries supplying the air forces and the navy rather than on munitions for land warfare.

In a survey of favorable and unfavorable factors in the week's trade developments, based on cables, radiograms and other reports received in the Department of Commerce, it was reported that the balance in favor of Germany in Italy's clearing account with that country increased considerably during October.

This was possibly because of shipments of other needed raw materials in addition to the regular large consignments of coal. Departure of an additional 20,000 laborers from Italy to Germany is reported in the press, indicating a possible means by which the accounts between the two countries may be brought into balance.

## AFL-CIO Fight Threatens Allis Defense Output

Milwaukee

••• An altercation on an adjoining street between AFL and CIO workers may result in a walkout to be called by the CIO at the huge Allis-Chalmers Mfg. Co. plant. The eight men involved in the incident have been laid off. For the first time, the company has issued a statement outlining its stand on a labor controversy which ends with the explanation that it is willing to arbitrate in this case because of the vital work in its shops for the national defense. There is about \$26,000,000 of such work in actual production and many millions more on the boards.

Another serious labor crisis involves some 25,000 workers in four plants of the International Harvester Co., where a walkout is threatened because of the failure of the national labor relations board to hand down a decision in the CIO union's case charging the firm with fostering company unions.

## Carbide Tool Co. to Treble Plant Capacity

Chicago

••• Carbide Tool Co. will treble plant capacity with a 15,000 sq. ft. addition scheduled for completion early in February. Considerably more than the \$35,000 cost of the new building will be spent for new lathes, milling machines and grind-

ing machines which were ordered several months ago. Another Chicago firm, Clearing Machine Corp., will start its sixth expansion move since it was established a little over seven years ago. Over a quarter of a million dollars will be spent for new equipment and the latest plant addition, which will bring total floor space to over 100,000 sq. ft. and is expected to increase production about 25 per cent.

## LIGHTER GAUGE STAMPINGS, too



The versatility of our men and machines is limited only by the needs of those who entrust to us the important task of producing their stampings.

In the instance illustrated, a Tank Rim for an electrical transformer—16 $\frac{3}{4}$ " long, 18 $\frac{1}{8}$ " wide and 5 $\frac{1}{4}$ " deep—was stamped out of steel .075" thick. Yet each angle, arc, port and flange is clean and clear—and true to gauge.

Present your problems to Parish. The services of our engineers frequently result in economies of important proportions . . . yet their contributions are not evident in our costs.

Let us review your requirements.

**PARISH PRESSED STEEL CO.**  
READING, PA.

PACIFIC COAST REPRESENTATIVE, F. Samers Peterson Co., 57 California St., San Francisco, Cal.

# Government Awards

Government awards during the week ended Jan. 4, according to the Division of Public Contracts, Department of Labor, are as follows:

## Iron and Steel Products:

American Bridge Co., Pittsburgh, Pa.; steel towers	\$178,080
American Chain & Cable Co., Inc., American Cable Div., Wilkes-Barre, Pa.; jackstays	330,678
Automatic Pencil Sharpener Co., Division of Spengler-Loomis Mfg. Co., Chicago; sharpeners	12,618
Baldt Anchor, Chain & Forge Corp., Chester, Pa.; hoist chains	23,976
Bethlehem Steel Co., Bethlehem, Pa.; trash racks	12,900
Bethlehem Steel Export Corp., New York; steel pipe	66,525
Chicago Bridge & Iron Co., New York; water tank	29,920
Crane Co., Washington; valves	64,327
Crucible Steel Co. of America, New York; slab steel	11,385
Detroit Michigan Stove Co., Detroit; army ranges	299,250
Detroit-Mich. Stove Co., Detroit; army ranges	110,000
Doehler Die Casting Co., Pottstown, Pa.; nozzles and angle tubes	26,579
Flockhart Foundry Co., Newark, N. J.; stretcher	11,356
H. J. Harrold Tool Co., Columbi-ana, Ohio; screwdrivers	16,465
Hershey Metal Products, Inc., Derby, Conn.; steel cores	106,675

Hickman, Williams & Co., New York; pig iron	14,655
Indianapolis Stove Co., Indianap-olis, Ind.; heating stoves	14,665
Irving Subway Grating Co., Inc., Long Island City, N. Y.; ham-mers, clip	203,845
Laclede Steel Co., St. Louis; re-inforcing bars	20,529
Leach & Co., Oshkosh, Wis.; buoy shackles	19,466
McKay Co., Pittsburgh, Pa.; chains, rings	162,848
Machine Products Corp., Detroit; cast iron blocks	14,482
Noland Co., Inc., Washington; plumbing fixtures	17,915
Phillips & Butterff Mfg. Co., Nash-ville, Tenn.; heating stoves	21,731
Pollak Mfg. Co., Arlington, N. J.; cartridges	515,440
Portland Forge & Foundry Co., Portland, Ind.; shell	94,940
Protectoseal Co. of America, Inc., Chicago; gasoline cans	20,060
C. J. Rainear & Co., Inc., Phila-delphia; steel flanges	18,724
Republic Steel Corp., Bolt & Nut Division, Cleveland; mach. bolts	25,088
Republic Steel Corp., Bolt & Nut Division, Cleveland; nuts	21,135
Republic Steel Corp., Massillon, Ohio; steel sheet	10,683

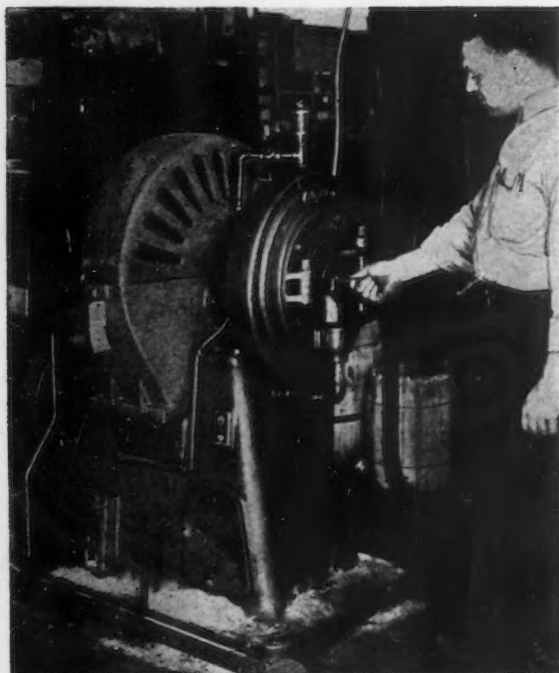
Russell Harrington Cutlery Co., Southbridge, Mass.; bread knives	37,375
Simonds Saw & Steel Co., Boston; cross-cut saws	10,580
Talc, Inc., Meadville, Pa.; slide fasteners	18,139
Texasteel Mfg. Co., Fort Worth, Tex.; projectile	1,195,000
Timken Roller Bearing Co., Steel & Tube Div., Canton; steel tub-ing	19,061
Tippett & Wood, Phillipsburg, N. J.; buoys	10,600
Truscon Steel Co., Youngstown, Ohio; reinforcing bars	22,876
U. S. Pipe Bending Co., San Fran-cisco; pipe fittings	11,000
United States Steel Export Co., Washington; tracks, pipe	20,209
Wheeling Corrugating Co., Inc., Louisville, Ky.; stovepipe hoods	10,521
J. H. Williams & Co., New York; wrench	11,082

## Other Machinery:

American Chain Division of Ameri-can Chain & Cable Co., Inc., York, Pa.; rings and shackles	\$10,923
American Laundry Machine Co., Cincinnati; laundry mach.	294,457
Buda Company, Harvey, Ill.; engi-neering parts	19,610
Carey Mach. & Supply Co., Balti-more; lathes	11,415
Cincinnati Milling Machine & Cin-cinnati Grinders, Inc., Cincinnati; milling machines	71,349
Colson Corp., Elyria, Ohio; stand assemblies	36,270
Duplex Truck Co., Lansing, Mich.; generator plants	140,800
Florence Pipe Foundry & Machin-ery Co., Philadelphia; flanging press	19,170
Food Machinery Corp., Peerless Pump Division, Los Angeles; pumping units	14,414
Gisholt Machine Co., Madison, Wis.; lathes	48,773
Green-Winkler Co., Seattle; galley equipment	30,930
Harold D. Gumpfer, The Ready Power Co., Detroit; generator units	43,960
Hobart Mfg. Co., Troy, Ohio; dishwashers	38,060
Hyde Windlass Co., Bath, Me.; steering gears	103,080
International Metal Hose Co., Cleveland; flexible tubes	73,750
Maurice A. Knight, Akron, Ohio; dryer units	11,967
Kohler Co., Kohler, Wis.; gas gen-erator sets	57,813
Kohler Co., Kohler, Wis.; general units	19,056
Lidgerwood Mfg. Co., Elizabeth, N. J.; windlasses	83,560
Monarch Machine Tool Co., Sidney, Ohio; lathes	11,866
National Twist Drill & Tool Co., Detroit; twist drills	455,140
Northern Commercial Co., Seattle; excavators	70,267
Omaha Steel Works, Omaha; ma-chining	2,570,750
Orton Crane & Shovel Co., Chi-cago; locomotive crane	13,087
Pomona Pump Co., Pomona; pump equipment	23,958
Pratt & Whitney Division, Niles-Bement-Pond Co., Hartford, Conn.; machine	39,391
Providence Mill Supply Co., Provi-dence, R. I.; vises	31,987
Reading Chain & Block Corp., Reading, Pa.; chain hoists	40,950
Snow & Petrelli Mfg. Co., New Haven, Conn.; gears	24,888
Standard Machinery Co., Provi-dence, R. I.; rollers	15,753
Worthington Pump & Machine Corp., Washington; pumps	24,418

## MAKING SAFETY A CERTAINTY

*At a Profit*



## WITH ETNA SWAGING MACHINES

Since putting ETNA Swaging Machines to work on this specific job (which is one that requires outstanding finished product dependability), this manufacturer is making safety a certainty on every job that leaves his shop—and at a profit too. The machine shown here, like every ETNA unit, is a consistent performer—the product of more than a quarter century of qualified experience. The ETNA drum is of alloy steel securely mounted on the base; Timken Bearings carry the main load on the spindle and thrust; the spindle is an alloy steel forging, heat treated and ground; the hammers, rolls and inner ring are of carefully selected alloys, and the motor is mounted on an adjustable bracket. ETNA Swaging Machines are built in capacities of ½" to 4" diameter with die lengths 1" to 18". Larger sizes built to order.

The Above Photograph Shows a Production Operation That Calls for Dependable Performance—Swaging Fittings On To Flexible Cables for Automobile Brake Assemblies and Airplane Controls—And It Is Profitably and Rapidly Handled With This ETNA SWAGING MACHINE!

WRITE NOW  
FOR LATEST  
BULLETINS

THE ETNA MACHINE COMPANY  
3400 Maplewood Ave. Toledo, Ohio



## GOVERNMENT AWARDS

Worthington Pump & Machinery Corp., Harrison, N. J.; construction equipment .....	10,227
Yale & Towne Mfg. Co., Philadelphia; chain hoists .....	56,700

### Nonferrous Metals and Alloys:

Aluminum Co. of America, Washington; magnesium powder ..	\$44,460
Aluminum Co. of America, Pittsburgh, Pa.; aluminum alloy ..	29,579
American Brass Co., Waterbury, Conn.; cartridge disc .....	644,393
American Brass Co., Waterbury, Conn.; tubing .....	40,441
American-La France-Foamite Corp., Elmira, N. Y.; fire extinguishers ..	31,130
American Smelting & Refining Co., New York; copper, ingot .....	109,060
American Smelting & Refining Co., New York; pig lead .....	36,960
Bridgeport Brass Co., Bridgeport, Conn.; brass tubes .....	31,507
Calumet & Hecla Consolidated Copper Co., New York; ingot copper ..	48,200
Chase Brass & Copper Co., Inc., Waterbury, Conn.; pipe and tubing .....	277,013
Chase Brass & Copper Co., Inc., Waterbury, Conn.; brass .....	21,465
International Silver Co., New York; forks, knives, spoons .....	31,523
Lewin Mathes Co., East St. Louis, Ill.; copper ingots .....	14,568
Northwest Lead Co., Seattle, Wash.; sheet lead .....	13,408
Oneida, Ltd., Oneida, N. Y.; forks, knives, spoons .....	86,600
Revere Copper & Brass, Inc., Balt. Div., Baltimore; rotating bands ..	342,677
Revere Copper & Brass Co., Balt. Div., Baltimore; cartridge disc ..	764,480
Revere Copper & Brass, Inc., Balt. Div., Baltimore; cartridge cups ..	141,393
George Sall Metals Co., Philadelphia; copper scrap .....	10,930
Scovill Mfg. Co., Waterbury, Conn.; copper-nickel tubing .....	10,778
R. Wallace & Sons Mfg. Co., Wallingford, Conn.; plates ware ..	23,421

### Commodity:

Bausch & Lomb Optical Co., Rochester, N. Y.; telescopes, ship ..	\$46,845
Bigelow-Sanford Carpet Co., Inc., New York; machines, bucket cutting .....	63,000
Caterpillar Tractor Co., Peoria, Ill.; tractors, gasoline engine driven ..	62,232
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, Ohio; machines, milling, vertical ..	31,929
Franklin Sales Co., Inc., Fort Myers, Fla.; mowers, rotary, gasoline .....	11,627
Kilby Steel Co., Anniston, Ala.; cutters, spike and star .....	167,193
J. Klein & Son, Chicago; pipe, iron (wrought) and steel .....	370,390
Thorrez and Maes Mfg. Co., Jackson, Mich.; bodies, steel .....	216,385
Wire Rope Corp. of America, New Haven, Conn.; rope, wire, steel, plow .....	10,896

### Air Corps:

Alock Leitman Lite Mfg. Co., New York; assemblies .....	\$27,600
Arnold, Schwill & Co., Chicago; assemblies, wheel .....	63,918
Bendix Aviation Corp., Pioneer Instrument Div., Bendix, N. J.; octants .....	362,362
Candler-Hill Corp., Detroit; pump assemblies .....	141,775
Denison Engineering Co., Columbus, Ohio; stand assemblies ..	127,952
Fairchild Aviation Corp., Jamaica, L. I., N. Y.; octants .....	303,600
Federal Motor Truck Co., Detroit; truck tractors .....	185,200

Heil Co., Milwaukee; trailers and dollies .....	992,550
K. Kaufmann & Co., Inc., Newark, N. J.; assemblies .....	35,100
Link Aviation Devices, Inc., Binghamton, N. Y.; octants .....	62,500
C. F. Peace Co., Chicago; dryer, photographic print .....	98,948
Sharpsville Steel, Fabricators, Inc., Sharpsville, Pa.; tanks, fuel ..	373,200
Steel Products Engineering Co., Springfield, Ohio; vacuum chamber equipment .....	54,417

### Corps of Engineers:

Barco Manufacturing Co., Chicago; portable gas hammers .....	\$394,542
Carver Pump Co., Rock Island, Ill.; pumping sets .....	71,869
Continental Motors Corp., Muskegon, Mich.; elec. generating sets ..	35,427
Davenport Besler Corp., Davenport, Iowa; locomotives .....	61,185
Ensign Bickford Co., Simsbury, Conn.; blasting equipment .....	31,315
General Electric Co., Erie, Pa.; locomotives .....	135,225

W. & L. E. Gurley, Troy, N. Y.; compasses .....	363,500
Hercules Powder Co., Wilmington, Del.; blasting equipment .....	24,539
Industrial Brownhoist Corp., Bay City, Mich.; cranes .....	25,950
Sperry Gyroscope Co., Inc., Brooklyn; searchlight parts .....	61,776
Vulcan Iron Works, Wilkes-Barre, Pa.; locomotives .....	61,100
Whitcomb Locomotive Corp., Rochelle, Ill.; locomotives .....	61,460

### Medical Department:

Aluminum & Brass Co., Lockport, N. Y.; high pressure cylinder valves .....	\$13,500
American Sterilizer Co., Erie, Pa.; sterilizers .....	35,005
Art Metal Construction Co., Washington; filing cabinets .....	7,600
Bausch & Lomb Optical Co., Rochester, N. Y.; dark field apparatus for microscope .....	5,396
Becton Dickinson & Co., Rutherford, N. J.; surgical instrument and appliances .....	5,089

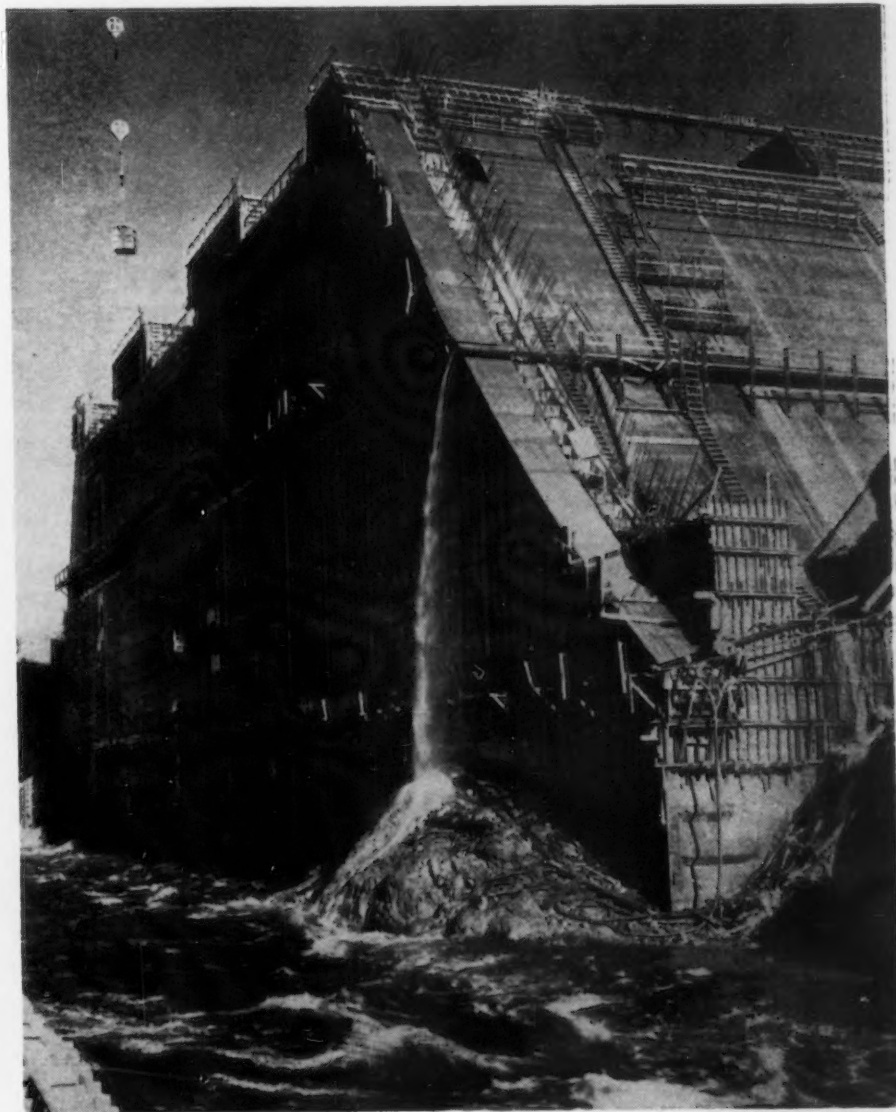


Photo by Wide World

**DOWNSTREAM FACE:** This concrete slope is part of the downstream face of Shasta Dam which eventually will rise 560 ft., second highest dam in the world. In the foreground the Sacramento River flows in a temporary diversion channel. At the upper left a 16-ton bucketfull of concrete comes over from the mixing plant.

# GOVERNMENT AWARDS

Brooklyn Hospital Equipment Co., Johnstown, Pa.; hospital equip- ment .....	134,300
Doehler Metal Furniture Co., Inc., New York; cabinets .....	73,199
General Electrical Supply Corp., Washington; refrigerators .....	27,890
General Fireproofing Co., Wash- ington; desks, office, steel .....	7,426
General Fireproofing Co., New York; office chairs and equip- ment .....	28,455
Harris Hub Bed & Spring Co., Cicero, Ill.; steel cabinets .....	47,150
Lalace & Grosjean Mfg. Co., Woodhaven, N. Y.; mess equip- ment .....	71,513
Oneida, Ltd., Oneida, N. Y.; mess equipment .....	11,855
Ransom & Randolph Co., Toledo, Ohio; burs .....	9,447
Scanlan-Morris Co., Madison, Wis.; sterilizers .....	27,810
Spencer Lens Co., Buffalo, N. Y.; microscopes and dark field ap- paratus .....	50,496
Tower Co., Inc., Seattle, Wash.; surgical instruments and appli- ances .....	9,319

## Quartermaster Corps:

A-AN-E Mfg. Corp., Chicago; re- pair parts for cots, folding steel	\$44,250
Central Stamping Co., Newark, N. Y.; kitchenware: plates, pie	8,666
Fred J. Early, Jr., Company, San Francisco; gasoline storage tanks	27,740
A. J. Honeycutt Company, Bir- mingham, Ala.; gasoline storage and dispensing system .....	4,983
International Silver Co., Meriden, Conn.; utensils, knives, forks, spoons .....	31,523
Kilby Steel Co., Anniston, Ala.; repair parts for cots, folding steel .....	54,000
A. Kremer, Inc., Brooklyn; kitch- enware: measures, tin .....	3,900
Logan Electric Spec. Co., Chicago; repair parts for cots, folding steel .....	60,000
National Enameling & Stamping Co., Laurel Hill, Long Island City, N. Y.; containers, water, 5-gallon .....	160,390
Pittsburgh Des Moines Steel Co., Pittsburgh; water tank .....	26,490
Pittsburgh Des Moines Steel Co., Pittsburgh; steel tank, piping and accessories .....	52,885

## Signal Corps:

American Automatic Electric Sales Co., Chicago; telephone central office equipments .....	\$259,038
Cook Electric Co., Chicago; jacks	35,278
S. H. Couch Co., Inc., North Quincy, Mass.; terminal strips..	21,758
Dean W. Davis & Co., Chicago; coils .....	11,233
Froiland Mfg. Co., Springfield, Mass.; miscellaneous control units and couplings .....	13,019
General Electric Co., Schenectady, N. Y.; radio transmitting equip- ment .....	241,475
Gussack Machined Products, Inc., Long Island City, N. Y.; cable	9,660
Jacobsen Mfg. Co., Racine, Wis.; reel units .....	37,380
Kellogg Switchboard & Supply Co., Chicago; microphones and jacks	12,358
Molded Insulation Co., Philadel- phia; switch boxes .....	14,948
R.C.A. Mfg. Co., Inc., Camden, N. J.; radio sets .....	594,992
United Transformer Corp., New York; coils .....	41,157
Widin Metal Goods Co., Garwood, N. J.; mast sections for radio sets .....	18,020

## Ordnance Department:

Adirondack Foundries & Steel, Inc., Watervliet, N. J.; castings .....	\$8,372
Allegheny Forging Co., Pittsburgh; forgings .....	2,160
Allegheny Ludlum Steel Corp., Brackenridge, Pa.; gages .....	41,500
Aluminum Co. of America, Fair- field, Conn.; aluminum alloy castings .....	8,389
American Brass Co., Waterbury, Conn.; artillery ammunition com- ponents .....	163,340
American Brass Co., Waterbury, Conn.; artillery ammunition ..	3,022
American Chain & Cable Co., Inc., Bridgeport, Conn.; small arms ammunition components .....	55,000
Apex Tool & Cutter Co., Inc., Shelton, Conn.; holders .....	2,057
Apex Tool and Cutter Co., Inc., Shelton, Conn.; cutters .....	6,669
Atlantic Elevator Co., Philadel- phia; ammunition components..	10,000
Atlantic Mfg. Co., Philadelphia; artillery ammunition components	5,125
Autocar Co., Ardmore, Pa.; auto- motive equipment .....	40,775
Barker Tool Die & Gauge Co., De- troit; gages .....	1,756
Barwood & Co., Philadelphia; gages .....	6,485
Bausch & Lomb Optical Co., Roch- ester, N. Y.; fire control equip- ment .....	12,141
Bay State Tool & Machine Co., Springfield, Mass.; small arms material .....	3,022
Bearing Co. of America, Lancaster, Pa.; ball bearings .....	8,534
Bendix Aviation Corp., Marine Division, Brooklyn, N. Y.; fire control equipment .....	78,710
Bridgeport Brass Co., Bridgeport, Conn.; ammunition components.	53,750
Bridgeport Brass Co., Bridgeport, Conn.; artillery ammunition ..	86,175
Brown & Sharpe Mfg. Co., Phila- delphia; gages .....	14,203
Brown & Sharpe Mfg. Co., Provi- dence, R. I.; machines grinding.	3,363
Canister Co., Phillipsburg, N. J.; machines .....	3,636
Cape Ann Tool Co., Pigeon Cove, Mass.; artillery material .....	7,362
Carboloy Co., Inc., Detroit; ream- ers .....	2,600
Central Steel Tube Co., Clinton, Iowa; mounts, tripod .....	302,240
Champion Machine & Forging Co., Cleveland; forgings .....	8,091
C. B. Christianson, Newark, N. J.; machinery .....	14,940
Cincinnati Gilbert Machine Tool Co., Cincinnati; machines, mill- ing, boring, drilling .....	28,650
Clearing Machine Corp., Chicago; presses .....	27,700
Cleveland Cutter & Reamer Co., Cleveland; cutters, side milling.	1,794
Cleveland Twist Drill Co., Cleve- land; reamers .....	2,320
Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.; small arms material .....	246,037
Colt's Patent Fire Arm Mfg. Co., Hartford, Conn.; artillery ma- terial .....	349,328
Continental Tools Works, Detroit; broaches .....	14,925
DeLisser Machine & Tool Corp., New York; gages .....	9,408
Detroit Broach Co., Detroit; broaches .....	2,250
Dienelt & Eisenhardt, Inc., Phila- delphia; artillery ammunition components .....	30,060
Doehler Die Casting Co., Pottstown, Pa.; artillery ammunition com- ponents .....	20,860
E. I. du Pont de Nemours & Co., Wilmington, Del.; small arms ammunition components .....	4,561

Duriron Co., Inc., Dayton, Ohio; machines .....	140,000
Emeis Electrical Service, Daven- port, Ia.; gages and speedometers	5,708
Ex-Cell-O Corp., Continental Tool Works, Div., Detroit; cutters ..	1,216
Ex-Cell-O Corp., Detroit; machines, grinding .....	3,158
Federal Screw Works, Detroit; ar- tillery ammunition components.	1,199
Chas. Fischer Spring Co., Brook- lyn, N. Y.; small arms material.	3,627
Foot-Burt Co., Cleveland; presses, drill .....	11,305
Julian P. Friez & Sons, Baltimore; artillery material .....	10,000
Frost Company, Kenosha, Wis.; artillery ammunition .....	301,696
Gilbert & Barker Mfg. Co., Spring- field, Mass.; boiler plates for boilers .....	3,085
Globe Machine & Stamping Co., Cleveland; artillery ammunition	491,000
Goodman Mfg. Co., Chicago; forg- ings .....	1,932
Graybar Electric Co., Inc., Daven- port, Ia.; ammeters .....	1,190
Greenfield Tap & Die Co., Green- field, Mass.; taps .....	3,080
Greenfield Tap & Die Co., Green- field, Mass.; gages .....	2,920
Guiberson Diesel Engine Co., Chi- cago; starters, combustion type.	269,875
Hanson-Whitney Machine Co., Hart- ford, Conn.; gages .....	44,966
Hartford Machine Screw Co., Hart- ford, Conn.; ammunition compo- nents .....	6,257
W. F. Hebard & Co., Chicago; tractors, industrial .....	1,427
Hobart Mfg. Co., Troy, Ohio; fire control equipment .....	51,343
Hoover Ball & Bearing Co., Chi- cago; bearings, ball .....	2,071
Illinois Tools Works, Chicago; reamers .....	3,019
Imperial Brass Mfg. Co., Chicago; connectors, bronze .....	1,397
International Harvester Co., Chi- cago; tractors, diesel, and mis- cellaneous parts for tractor ..	261,771
International Harvester Co., Chi- cago; tractor parts .....	103,599
International Harvester Co., Chi- cago; artillery ammunition ..	108,000
Johnson Engineering Mfg. Co., Wilkes-Barre, Pa.; ammunition components .....	18,430
John P. Kelly, Philadelphia; cast- ings, bronze, aluminum .....	2,971
Landis Tool Co., Waynesboro, Pa.; machines, grinding .....	32,592
Landis Tool Co., Waynesboro, Pa.; machinery .....	1,214
LaPointe Machine Tool Co., Hud- son, Mass.; machines .....	5,586
A. Leschen & Sons Rope Co., St. Louis, Mo.; cables, towing .....	4,125
Lincoln Engineering Co., Baltimore; automotive equipment .....	2,040
Lloyd & Arms, Inc., Philadelphia; machines .....	15,500
Lloyd & Arms, Inc., Philadelphia; presses .....	1,874
McReynolds Die & Tool Co., De- troit; dies .....	3,607
Machinery Builders, Inc., Long Island City, N. Y.; machines ..	1,320
Magnaflux Corp., Chicago; ma- chines .....	4,796
Magnus Tool & Die Co., Newark, N. J.; tools .....	3,444
Marshall & Huschart Machinery Co., Chicago; machines, broach- ing .....	9,004
Mattison Machine Works, Rockford, Ill.; saws, cut off .....	1,520
Midvale Co., Nicetown, Philadel- phia; artillery material .....	18,765
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.; fire con- trol equipment .....	1,598
Modern Tool & Die Co., Philadel- phia; gages .....	9,250



## GOVERNMENT AWARDS

George W. Moore, Boston; ammunition components .....	1,430
J. W. Moore Machine Co., Everett, Mass.; gages .....	1,180
Murdock Tool Co., Detroit; tools .....	2,938
Narragansett Machine Co., Providence, R. I.; small arms material .....	27,586
National Gas Furnace Co., Providence, R. I.; furnaces, gas-fired .....	2,167
National Malleable & Steel Castings Co., Cleveland; artillery ammunition .....	147,000
National Tube Co., Chicago; tubing, steel .....	1,655
New Jersey Fulgent Co., Inc., Metuchen, N. J.; flares .....	639,960
Niles-Bement-Pond Co., Pratt & Whitney Div., West Hartford, Conn.; grinders and contour cutters .....	7,455
Niles-Bement-Pond Co., Pratt & Whitney Div., Hartford, Conn.; gages .....	3,151
Nutley Engineering Works, Nutley, N. J.; machinery .....	3,835
Onsrud Machine Works, Inc., Chicago; router .....	1,442
Otis Elevator Co., Buffalo, N. Y.; castings, steel .....	42,568
Pacific Foundry Co., Ltd., San Francisco; machines .....	71,200
Pangborn Corp., Hagerstown, Md.; ventilating system .....	2,786
Peco Corp., Philadelphia; artillery ammunition components .....	359,960
Peters Engineering Co., Philadelphia; gages .....	1,488
Poor & Co., Canton, Ohio; artillery material .....	4,784
Porter Forge & Furnace, Inc., Everett, Mass.; artillery material .....	1,267
Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn.; gages .....	2,259
Precise Tool & Mfg. Co., Farmington, Mich.; gages .....	35,795
Production Tool & Die Co., Inc., Springfield, Mass.; machines, press .....	6,500
Putnam Tool Co., Detroit; cutting tools .....	1,012
Remington Arms Co., Inc., Bridgeport, Conn.; small arms ammunition .....	11,982
Republic Steel Corp., Chicago; steel .....	6,537
Republic Steel Corp., Steel & Tube Div., Cleveland; ammunition components .....	95,904
Revere Copper & Brass, Inc., Baltimore Div., Baltimore, Md.; brass .....	361,350
Frank Rose Manufacturing Co., Hastings, Neb.; artillery ammunition .....	206,323
Joseph T. Ryerson & Son, Inc., Chicago; artillery material .....	38,328
S. K. F. Industries, Inc., Philadelphia; bearings, ball .....	3,929
Schutte & Koerting Co., Philadelphia; machines, tumbling polishing .....	2,200
Sears Saddlery Co., Davenport, Iowa; ammunition components .....	2,120
Sheffield Gage Corp., Dayton; gages .....	16,116
Shuler Axle Co., Inc., Louisville, Ky.; artillery material .....	20,679
Standard Gage Co., Inc., Poughkeepsie, N. Y.; gages .....	17,175
Standard Machinery Co., Providence, R. I.; roller bearings .....	3,072
Standard Machinery Co., Providence, R. I.; artillery material .....	5,160
Steadfast & Roulston, Inc., Cincinnati; boring mills .....	61,154
Taft-Peirce Mfg. Co., Woonsocket, R. I.; gages .....	14,092
Thomson-Gibb Electric Welding Co., Lynn, Mass.; welders .....	1,876
Thurston Mfg. Co., Providence, R. I.; cutters .....	1,180



**FREIGHT PLANES:** Increase in heavier shipments of air express has warranted United Air Lines on Jan. 1 to establish the nation's first high speed express freight plane service between New York and Chicago, non-stop, where it connects with planes to all parts of the country. This freight plane service utilizes the pickup and delivery system of the Railway Express Agency and is supplementary to the regular plane service which in addition to passengers also carries a thousand pounds of cargo. The all freight plane carries 5000 lb. of miscellaneous shipments.

Timken-Detroit Axle Co., Wisconsin Axle Div., Oshkosh, Wis.; automotive equipment .....	1,810
Timken Roller Bearing Co., Canton, Ohio; bearings .....	3,394
Tools and Gages, Inc., Cleveland; gages .....	24,670
Tredegar Company, Richmond, Va.; artillery ammunition .....	157,512
True Alloys, Inc., Detroit; castings .....	3,719
Tucker Aircraft Co., Detroit; automotive equipment .....	22,750
Union Twist Drill Co., Chicago; drills .....	1,986
Union Twist Drill Co., Athol, Mass.; cutting tools .....	1,476
Union Twist Drill Co., Butterfield Div., Derby Line, Vt.; taps .....	1,102
Veit & Young, Philadelphia; tools for small arms .....	4,980
Veit & Young, Philadelphia; dies .....	4,150
Vernco Specialties Co., New York; artillery ammunition components .....	12,739
Waltham Machine Works, Waltham, Mass.; machines, gear cutting .....	3,070
Wang Textile Co., Schenectady, N. Y.; artillery ammunition components .....	7,470
Weldon Tool Co., Cleveland; cutters .....	1,584
Weldon Tool Co., Cleveland; tools .....	1,113
S. K. Wellman Co., Cleveland; facing, clutch and rivet, steel .....	6,738
Western Cartridge Co., East Alton, Ill.; small arms ammunition .....	33,385
Westhead Co., Cleveland; automotive equipment .....	1,380
Wiedemann Machine Co., Philadelphia; gages .....	21,280
Winchester Repeating Arms Co., New Haven, Conn.; artillery ammunition components .....	7,500
Wright Aeronautical Corp., Paterson, N. J.; hubs, flywheel .....	1,072

### Warner & Swasey Gets More Lathe Space Cleveland

• • • To expedite machine tool shipments for the British in the present emergency, Warner & Swasey Co. has rented 43,000 sq. ft. of floor space in a one-story structure several blocks from its plant. The company expects to equip the building and be working in it within 30 days.

The new space will be used for assembly of turret lathes. Some machinery will be required but for the most part the equipment to be installed consists of cranes and other material handling devices. Preliminary estimates indicated that around 100 men would be hired. It is understood the parts to be assembled will come from sub-contractors and it is presumed this will mark additional farming-out of work by the company.

Three expansions have been announced by the company since war began in Europe. Application has been made for amortization of part of the added facilities.

## "Big Three" Will Build Bombers

*Detroit*

Plans for utilization of facilities of the "big three" auto makers for the manufacture of Army bombers are rapidly taking shape. As has been anticipated by the principals, the plans now taking shape indicate some modification of original ideas on means and methods, and on the placing of responsibility for production, but the new plans carry out in essentials the proposals laid down Oct. 25 by William S. Knudsen, defense commissioner. Involved is a change in the functions of the automotive committee for air defense which will shift chief responsibility for the program from the committee to the three manufacturers.

Under the new arrangement, Ford Motor Co., General Motors Corp. and Chrysler Corp. probably will each receive a prime sub-contract from one of the major airplane companies and will be responsible for the manufacture of parts and sub-assemblies and lining up their own peacetime suppliers to provide additional parts making capacity.

It is indicated that General Motors will accept the responsibility for production of the North Ameri-

can B-25 twin engine bomber (North American is a division of General Motors Corp.). Chrysler is expected to receive a prime sub-contract from Martin for manufacture of parts for the twin-engine B-26 bomber, and Ford, as indicated last week in statements by Edsel Ford, will accept the responsibility for Consolidated's four-engine B-24 bomber.

In each case it is expected that the initial order will be for 4000 planes. That would correspond with the original schedule announced in late October for 4000 four-engine bombers and 8000 twin-engine bombers.

Under the arrangements so far known to be planned, the unassembled sub-assemblies and parts will be shipped to final assembly plants owned by the government but managed by the primary airplane contractor. These plants will be erected at Omaha, Neb., Kansas City and Tulsa, Okla.

The modified plan is not expected to affect the existence of the Automotive Committee for Air Defense, which will continue to maintain an exhibit of needed parts in the Graham-Paige plant on West Warren Avenue and will continue to serve in a liaison capacity.

Such arrangements have been indicated for several weeks past as the most effective way of carrying out Knudsen's plan for making

use of usable automotive facilities. Last week's announcement by Edsel Ford in California precipitated a similar announcement by K. T. Keller, president of Chrysler Corp., at one of the SAE sessions during the week. A formal announcement of tentative plans was made Friday. Keller said that the Chrysler Corp. and Goodyear Tire & Rubber Co. would collaborate with the Glenn L. Martin Co. to produce 100 B-26 bombers a month. Chrysler will do sheet metal fabrication and manufacture fuselages in the former Graham-Paige buildings on West Warren, 600,000 sq. ft. of which have been leased by Chrysler. Goodyear will make the undercarriages while Martin will assemble completed planes and install engines.

Ford plans, according to reports based on Edsel Ford's statement last week in the West, are indefinite but involve an offer to assemble complete airplanes as well as fabricated parts.

GM has made no statement regarding its plans, but confirmation has come from Dr. George Meade, special aeronautical consultant of the National Defense Advisory Commission.

## Bohn Announces \$3,100,000 Expansion

*Detroit*

• • • Following announcement of a national defense contract for expansion of plant facilities to the extent of \$1,216,000, it was learned here that the Bohn Aluminum & Brass Corp. plans expansion to the amount of about \$3,100,000, including \$2,200,000 in equipment and \$900,000 in buildings. Key departments will be increased 100 to 300 per cent in capacity, and overall capacity will be upped 30 per cent. Three thousand will be added to the payroll, with the payroll amount expected to be increased about \$5,000,000 annually. It is believed that part of the expansion will be in the aluminum forging department, in view of repeated assertions that the aircraft industry is vitally in need of such forgings. Other departments manufacturing aircraft bearings, magnesium castings and aluminum and brass extrusions are likely to be expanded also.

**STEEL PANELED HOUSES:** This is a closeup view of Panelbilt two-family dwelling units at the Marine Corps base at Quantico, Va. They are the first units in the defense housing program to be of pre-fabricated all-welded steel construction. Siding, applied over an insulation board sheathing which in turn is attached to the steel framework, is of asbestos shingles. The Panelbilt system of pre-fabricated steel construction was developed by Tennessee, Coal, Iron & Railroad Co.





## Roosevelt May Get Supreme War Power Within 30 Days

Washington

• • • Some Congressional leaders forecast this week that the Administration's "blank check" aid-to-Britain bill will be placed on President Roosevelt's desk for final signature within a month or five weeks. Others, who said the measure embodied "a fantastic foreign policy", predicted "formidable" opposition.

Entitled "an act to promote the defense of the United States," the lend-lease measure delegates broad power to the President to furnish such materials to such countries as he finds will be in the interest of national defense.

The bill places no limit on the authorization of funds to carry out the program, amounts to be expended depending upon the determinations from time to time by the appropriation committees of both houses, but estimates of eventual cost have reached \$10,000,000,000. Senator Majority Leader Alben W. Barkley estimated that \$2,000,000,000 to \$5,000,000,000 may be appropriated this year. This, of course, would be over and above the \$17,500,000,000 budget recommendation submitted to Congress by the President.

In addition to empowering the White House to permit the use of any military, naval, or air bases to outfit and repair the weapons of countries whose defense is deemed vital to the United States, the bill would authorize:

1. The manufacture of war materials in government-owned arsenals, plants and shipyards for any countries whose defense is deemed essential.
2. The procurement or purchase of any war materials from private aircraft plants, shipyards or other plants.
3. The selling, leasing, lending or otherwise disposing of any war materials to any such country.
4. The communication to any such government of information on any defense article furnished

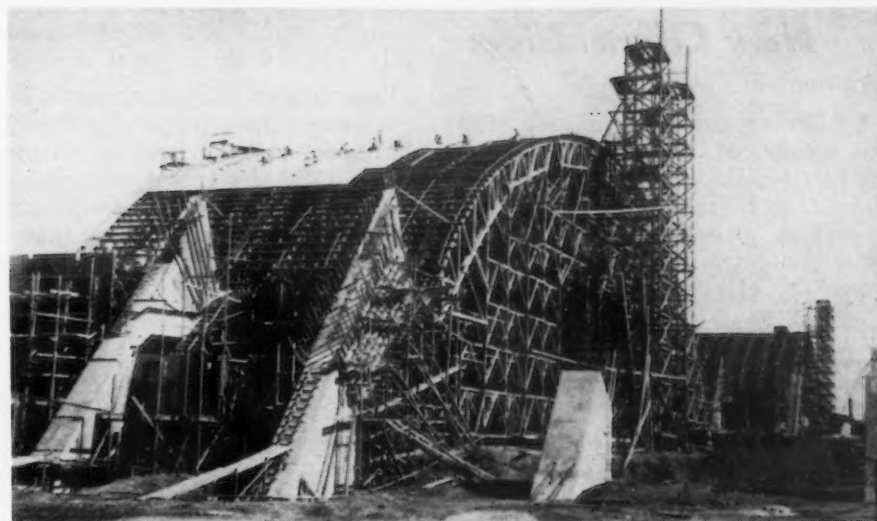


Photo by Wide World

**CARIBBEAN DEFENSES:** Shown here are hangars (for flying fortresses) under construction on the northwest tip of Puerto Rico where an \$8,100,000 Army airbase is being built.

to such government under the proposed bill.

5. The releasing of any defense article for export to any such government.

The President, who already has approved the bill down to the last comma, last week explained at his press conference that the legislation does not constitute in effect a repeal of the Johnson Act prohibiting loans to nations in default to this government. A provision authorizing him to give effect to the bill "notwithstanding the provisions of any other law" was described by Mr. Roosevelt as the usual clause inserted in legislation to forestall conflict between laws. His explanation was that the new measure would supersede any existing law where any conflict developed.

### Niagara Machine Installs New Furnaces

Buffalo

• • • The Niagara Machine & Tool Works, busy with production of large presses and shears for Canadian war industries, is installing four new heating and tempering furnaces with new equipment for cutting gears at its plant here. The company recently added a third shift, increasing employment from 250 six months ago to about 400 today.

### "G. M." Wilson and "G. E." Wilson get Mixed Up

• • • A headline on page 75-P of the Jan. 9 issue of THE IRON AGE stated in error that General Electric Co. had elected Charles E. Wilson president. The story referred to the election of Charles Erwin Wilson, acting head of General Motors Corp., to the presidency.

However, Charles E. Wilson (another Charles E.) is president of General Electric Co., and was one of those who sent congratulatory telegrams to the new General Motors official. He suggested "G.M." for "motors" and "G.E." for "electric" as a means of differentiating the names.

Still another Charles E. Wilson, who is vice-president of the Worthington Pump Co. of Holyoke, Mass., telegraphed his congratulations.

### Wright Monthly Engine Output Equals 1,000,000 hp.

• • • Curtiss-Wright Corp.'s production of airplane engines at its main plant at Paterson, N. J., now represents more than 1,000,000 hp. a month, compared with a 264,720 hp. monthly average two years ago, Guy W. Vaughan, president, reports. Current production is 700 per cent above the corporation's World War peak in September, 1918. Wright employment has risen from 6631 two years ago to 15,436.

## Farm Out Contracts, Navy Official Urges

Washington

• • • Giving further emphasis to the movement to speed defense production, Undersecretary of the Navy James Forrestal, pointing to a serious situation in fulfilling Navy contracts, has addressed an appeal to all contractors urging

them to "farm out" part of their work to subcontractors, "whose capacity would not otherwise be fully utilized on defense work."

Recognizing that comparatively few companies are considered qualified to take prime Navy contracts, Mr. Forrestal explained that there are, however, "many thousands of machine shops, foundries and plants of special types, many of them small, some, how-

ever, large, besides countless departments of companies whose main product is perhaps far removed from Navy requirements which have the equipment and personnel which could, with a certain amount of adaptation, perform operations that a given prime contractor could not himself quickly handle."

It was stated that under ordinary circumstances a manufacturer might be warranted in buying extra equipment or taking the extra time necessary to do the work with resources in his shop, rather than to farm it out, but that today neither of these courses should be followed except as a last resort.

Continuing, the Undersecretary of the Navy said: "America's tool making and equipment extending industries have more than they can do already in the way of constructing that equipment of which we have no adequate supply anywhere. Even where new and more efficient equipment should be ordered, it is important that in the meantime as much use as possible be made of older equipment already in existence.

"Companies having Navy contracts, but with facilities of certain types in excess of those which can be immediately used, are requested to make these facilities available to other companies engaged on defense work so long as they can do this without impairing their ability to expedite Navy orders as they come along. The department realizes that an extension of subcontracting will require an administrative effort on the part of the contractors and that its success depends upon the intelligence and energy with which it is conducted.



**RUSHED FOR DEFENSE:** One of the country's largest boring mills, pictured under construction at the Westinghouse East Pittsburgh, Pa., plant, has already gone into part operation. Pouring of concrete was started Aug. 1 and on Sept. 1 the concrete job was finished. Assembly was begun Oct. 1. Eleven freight cars were required for bringing in parts for the new boring mill. The mill can cut 14 miles of shavings from a 500-ton piece of steel an hour, supports its work pieces on an 88-ton turntable, and despite its 350 tons, has a normal accuracy of 4 thousandths of an inch.

## Gisholt Machine Co. Opens Northern Works

Madison, Wis.

• • • Gisholt Machine Co. here has reopened its Northern Works, also located in Madison, to meet the current demand for turret lathes. This move adds 60,000 sq. ft. to the present manufacturing facilities. Operations will start May 1 and production will be fully under way by the middle of the year. Work has already started on reconditioning the building, last used in 1930



### Small Arms Plant Will Cost \$102 Millions

Washington

••• The War Department has awarded a contract for \$102,249,880 on a cost-plus-fixed fee basis to the Remington Arms Co., Inc., Bridgeport, Conn., for equipping and operating of a small arms ammunition plant near Denver, Col. Of the total award \$14,800,000 represents the cost of equipment and management services in connection with the supervision of the equipment. The remainder of \$87,449,880 will cover operation of the plant.

The department has confirmed the selection of Tulsa, Okla., as a site for an assembly plant for heavy bombers. It will be constructed by the Army Corps of Engineers and will be operated under a management contract by the Douglas Aircraft Corp., Santa Monica, Cal.

The department also has announced the selection of Ft. Worth, Tex., as a site for a similar plant to be constructed by the Corps of Engineers and to be operated under a management contract by the Consolidated Aircraft Corp., San Diego, Cal.

### Calumet Pattern Works To Double Capacity

Chicago

••• Calumet Pattern Works is constructing a new building that will double the organization's present production capacity. The company plans to spend about \$20,000 under the expansion program, which will include the purchase of some new machinery, including grinders. It will be a one-story brick structure, and when completed, all equipment now being used in the present plant will be moved into the new building, which will measure 100 x 75 ft.

### Dodge to Make 10,419 Special Army Trucks

Detroit

••• A new order for 10,419 specially designed U. S. Army trucks to be made by Dodge was announced Friday by Chrysler Corp. through its Fargo division, a Chrysler truck sales organization, of which R. L. Biggers is president. This brings Chrysler's total U. S. and Canadian orders for trucks for the past twelve months to 57,700 units, valued at \$58,000,000. Shipments since Jan. 1, 1940, for the U. S. Army total 18,950 units, and for the Canadian and British exceed 7700. At present orders call for 25,561 U. S. Army trucks and more than 5000 for overseas. Production now is above 250 army trucks a day.

### Hagan Corp. to Build New Pittsburgh Plant

Pittsburgh

••• Hagan Corp., combustion and chemical engineering firm here, is contemplating construction of a large plant to be built on an 80-acre tract near here which is skirted by two railroads. According to G. W. Smith, general manager, a long range expansion program costing all told about half a million dollars is contemplated. No definite date on the beginning of the construction has been decided upon but the first phase probably will be undertaken "this coming year," according to Mr. Smith.

**SHIPS FOR BRITAIN:** Cargo vessels to be built for Britain by Todd Shipyard Corp. affiliates, in South Portland, Me., and Richmond, Cal., will look like this. Todd - Bath Iron Shipbuilding Corp. and the Todd - California Shipbuilding Corp. will construct 30 each of these vessels, 416 ft. long, 57 ft. beam, of 10,000 d.w. tons, costing \$1,600,000 each.

### Army Sets Up Nine Construction Zones

Washington

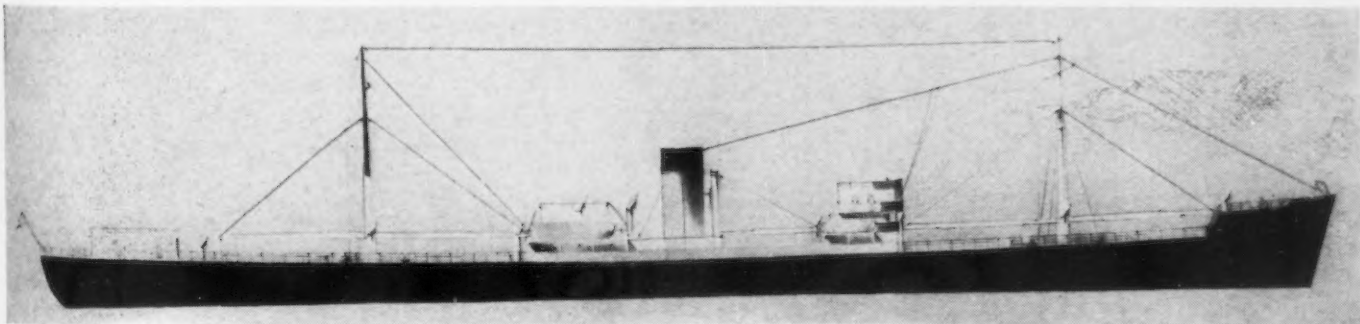
••• The War Department announces that nine principal construction zones, each in charge of a zone constructing quartermaster, have been established by the Quartermaster General, Maj. Gen. Edmund B. Gregory, to expedite the Temporary Emergency Construction Program.

The territorial limits of the Zones will coincide with those of the present nine Corps Areas. The headquarters of each Zone will be established in the same locality as that occupied by the headquarters of the Corps Area of corresponding number. Establishment of the nine construction zones has been effected for the purpose of facilitating supervision of construction work being performed by Constructing Quartermasters in the field and to speed up the building program.

### New Commodities Classification Published

Washington

••• Recent presidential proclamations listing commodities, the exportation of which thereby became subject to license, have included reference to the "commodity numbers" employed in compiling statistics of the export trade and listed in Schedule B, "Statistical Classification of Domestic Commodities Exported from the United States." Copies of a new (revised) issue of Schedule B, effective as of Jan. 1, are available. Copies may be had after that date from the Superintendent of Documents, Washington, D. C., district offices of the Bureau of Foreign and Domestic Commerce, and from Offices of Collectors of Customs.



## Republic Will Lift N. Y. Iron Ore Output

Cleveland

• • • Output of the Republic Steel Corp. mines in Northern New York state, now around 500,000 tons per year, will be increased sharply when improvements at the Witherbee-Sherman Mines, Mineville, N. Y., and Chateaugay Mine, Lyon Mountain, N. Y., are completed.

The expansion, announced Jan. 9 with the recent purchase of the Troy blast furnace, Troy, N. Y., and Republic's extensive operations in Buffalo, and its wet concentrator plant at Port Henry, N. Y., will make the company an even more important factor in the steel industry in the state. The iron ore, coke and limestone used at the Troy furnace are all produced in New York state.

At the Witherbee-Sherman properties a hoist capable of handling ore from a mile-deep shaft will be installed. The underground workings in the Old Bed and Harmony Mines eventually will be connected, simplifying future development, transportation, ventilation, drainage, and distribution of materials and supplies.

At the Chateaugay Mine the capacity of the mill will be increased about 15 per cent. The main hoisting shaft, now 1900 ft. in depth, will be extended an additional 650 ft.

The mine improvements when completed will require an expansion of the present payrolls. The development in New York State gives Republic extensive iron ore reserves in both the Lake Superior and the New York State Districts. With the improvements, in case of

need, either source could be developed to adequately supply Republic with its ore requirements.

In addition to its properties in the Great Lakes region, Republic also has extensive iron ore, coal and limestone reserves in the Birmingham District, which are used in its plants at Birmingham and Gadsden, Ala.

## 7% Wage Increase for Curtiss-Wright Employees

Pittsburgh

• • • Hourly paid employees at the Curtiss-Wright Corp. propeller plant here received an increase of 7 per cent in wages which will benefit between 600 and 700 employees who have been in the service of the company six months or longer.

## November Steel Exports From U.S. Total 788,176 Tons

### IMPORTS

November		Eleven Months Ended November	
1940	1939	1940	1939
98	2,774	10,242	37,274
26	5,698	20,525	64,925
82	96	1,192	1,623
8	3	223	281
...	172	610	1,703
252	837	1,978	28,325
466	9,580	34,770	154,131
...	154	440	600
...	...	...	...
...	917	3,986	9,634
...	1,071	4,426	10,234
4	18	120	1,404
...	...	...	...
...	...	...	...
1	3	13	27
...	...	...	...
53	597	1,860	18,922
4	92	198	752
...	...	...	...
1	71	871	1,256
...	363	624	23,406
...	...	...	...
6	530	716	38,398
10	...	26	5
11	15	115	80
...	...	...	...
82	...	113	4,484
140	320	2,857	25,741
...	...	...	...
6	166	889	2,248
13	121	519	1,558
...	174	86	14,924
105	271	2,161	4,291
1	162	109	7,117
1	9	130	105
1	1,480	1,584	7,769
...	6	12	38
...	...	3	324
439	4,398	15,006	153,361
...	104	419	1,582
...	...	29	144
75	63	589	1,100
...	...	...	...
75	167	1,037	2,826
980	15,216	53,239	300,552

### EXPORTS

November		Eleven Months Ended November	
1940	1939	1940	1939
27,838	36,618	484,615	158,112
246	1,065	12,833	1,857
1,579	555	21,844	3,194
74,349	272,656	2,753,108	3,371,025
104,012	310,891	3,272,400	3,531,188
226,437	28,464	2,024,969	119,176
58,404	16,809	236,982	36,575
21,547	25,359	138,249	69,876
22,169	4,236	270,804	24,630
328,557	74,868	2,671,004	250,257
43,880	20,994	452,329	245,775
10,473	11,184	151,213	98,297
1,232	229	9,060	3,324
148	202	1,609	970
58,586	21,469	525,497	228,332
3,066	94	5,226	2,043
45	15	452	122
61,894	20,429	614,029	154,476
788	202	12,955	746
2,062	2,015	37,310	11,800
297	5	1,318	246
18,857	9,771	181,017	74,695
148	22	1,527	458
49	72	837	931
616	89	11,841	7,085
36,524	12,999	366,733	103,127
5,670	3,165	67,973	30,109
14,107	47,041	367,519	252,895
2,928	2,619	28,861	23,737
13,646	8,351	105,041	46,456
15,624	15,248	196,556	80,204
3,364	2,835	24,290	10,896
4,726	4,673	80,475	27,321
1,496	574	12,147	5,003
4,854	7,107	46,246	51,051
11,258	7,706	121,300	53,092
886	996	6,915	5,718
4,619	963	30,480	7,729
21,385	5,877	252,143	67,559
2,090	1,387	19,726	8,317
345,318	208,333	3,732,625	1,602,511
3,809	5,873	67,276	38,559
352	452	4,619	3,975
3,980	2,479	34,414	17,749
269	240	4,627	3,056
1,879	2,516	16,505	25,694
10,289	11,560	127,441	89,033
788,176	605,655	9,803,470	5,475,992

<sup>1</sup> In imports the tonnage shown is the alloy content; the manganese chromium and silicon content, as the case may be. <sup>2</sup> Imports include skelp and saw plate. <sup>3</sup> Import figures includes iron slabs. <sup>4</sup> Imports include sashes and frames only.

\* No separate figures.



## Ship Program Called "Bridge to Britain"

Washington

••• The Administration's program to construct 200 cargo ships was described by an official of the National Defense Advisory Commission as "a bridge to Britain" last week, as the Maritime Commission released tentative design specifications and announced that sites for assembly work on the ships have been selected "to give the least possible interference with present national defense production."

The new ships, which will require an estimated 600,000 tons of steel and cost \$350,000,000, were referred to as "a bridge to Britain" in a radio address by Morris L. Cooke, Philadelphia consulting engineer who is working for Associate Director General Sidney Hillman of the Office of Production Management on a plan for "farming out" orders under the shipbuilding and other phases of the defense program.

President Roosevelt, who in announcing the new program two weeks ago was vague on the uses to be made of the ships, was quick to deny that he had ever described the plan in the terms used by Mr. Cooke. Previously, Mr. Roosevelt had indicated that he had no idea whether the cargo ships would be used to aid Great Britain.

Describing the rough details of the shipbuilding plan, Mr. Cooke revealed that the government hopes to "more than outdo" the production rate attained by the Hog Island shipyards during the first World War, when 160 ships were built on 40 shipways, 200 plants some as far west as the Mississippi produced the parts, and the assembly yards turned out as many as two ships a week.

"If you live in a community where there are machines which are idle even if only part time, and where there are unemployed skilled men and women, help get a community organization started to list these facilities, organize a pool with an operating head and

go after some of this defense work," urged Mr. Cooke, former head of the Rural Electrification Administration.

Authorized to purchase shipbuilding facilities up to \$36,000,000 to be installed at the sites, the Maritime Commission said that tentative designs for the ships, described as commodious efficient cargo carriers but simple and plain, call for a single type cargo vessel of 7500 gross tons, 10 to 11 knots speed, oil burning, with water tube boilers and an overall length of 425 ft. Simplicity and ease of construction will be paramount, the commission said.

Construction of the vessels, which cannot be started until enabling legislation is passed by Congress, will utilize government-owned facilities on privately-owned and privately-operated yards. Although the commission announced that sites have been selected to reduce interference with the commission's long-range shipbuilding program and with the naval shipbuilding program, their locations were not disclosed.

## Shipments of U. S. Steel Subsidiaries in 1940 Highest Since 1929

••• Shipments of finished steel by subsidiary companies of the U. S. Steel Corp. during 1940 were the heaviest in 11 years, preliminary figures show. The past year's shipments totaled 14,976,110 net tons, 28 per cent greater than the 1939 shipments, 11,707,251 tons, and only 11 per cent under the all-time record of 16,812,650 tons ship-

ped in 1929. For the year, shipments by the company averaged 77 per cent of capacity, as compared with 59.4 per cent in 1939, and 70.4 per cent in 1937, best of recent years in records of the steel industry.

December shipments, 1,544,623 tons, were the second highest of the year, being topped only by

those of October, 1,572,408 tons. The past month's deliveries, totaling 94.3 per cent of capacity, were 8 per cent ahead of the 89.6 per cent rate of November when 1,425,352 tons were shipped, and 7 per cent higher than the 1,443,969 tons shipped in December, 1939, when the rate averaged 85.8 per cent.

Month	1936		1937		1938		1939		1940	
	Shipments	Per Cent of Capacity*	Shipments	Per Cent of Capacity*	Shipments	Per Cent of Capacity*	Shipments	Per Cent of Capacity*	Shipments	Per Cent of Capacity*
January	795,214	44.8	1,268,403	75.4	570,264	33.7	870,866	51.3	1,145,592	69.8
February	747,375	45.3	1,252,845	82.5	522,395	35.5	747,427	49.3	1,009,256	65.8
March	863,946	50.5	1,563,113	92.7	627,047	37.2	845,108	50.4	931,905	56.8
April	1,080,667	63.2	1,485,231	91.0	550,551	33.7	771,752	47.5	907,904	57.1
May	1,087,395	63.4	1,443,477	85.5	509,811	30.2	795,689	47.4	1,084,057	66.0
June	978,030	57.1	1,405,078	85.8	524,994	32.1	807,562	49.7	1,209,684	76.1
July	1,050,085	61.3	1,315,353	77.9	484,611	28.8	745,364	44.5	1,296,887	79.2
August	1,019,852	59.6	1,225,907	72.6	615,521	36.3	885,636	52.7	1,455,604	88.6
September	1,060,708	62.0	1,161,113	71.1	635,645	37.5	1,086,683	66.9	1,392,838	87.8
October	1,108,973	62.6	875,972	52.0	730,312	43.1	1,345,855	79.9	1,572,408	95.8
November	974,292	59.2	648,727	39.7	749,328	45.6	1,406,205	86.1	1,425,352	89.6
December	1,178,598	68.8	539,553	32.1	765,868	45.2	1,443,969	85.8	1,544,623	94.3
Yearly adjustment	(-)40,163	...	(-)87,106	...	(+)29,159	...	(-)44,865	...	...	...
Total for year	11,905,002	58.2	14,097,666	70.4	7,315,506	36.1	11,707,251	59.4	...	...

\* Rolled and finished steel capacity. Shipments are in net tons.

## Canada Will Train 100,000 Workers

Ottawa

••• Plans to speed up training of men and boys for Canadian industry engaged in war work were announced by Labor Minister McLarty. The objective for 1941 is to train 100,000 workers. During the next fiscal year the Dominion government will spend \$4,365,000 of which \$1,345,000 will be allowances to men and boys to cover living expenses while they are taking courses in vocational schools. From the vocational schools the trainees will be moved to schools in industrial plants engaged on war work and a minimum scale of wages has been fixed which employers must pay the trainees working in their plants.

For the two-week period ended Jan. 3, the Department of Munitions and Supply, Ottawa, awarded 2956 contracts having a total value of \$12,374,417. The more important awards include:

Shipbuilding—Pictou Foundry & Machine Co., Ltd., Pictou, N. S., \$153,191; Halifax Shipyards, Ltd., Halifax, N. S., \$100,000; Canadian Power Boat Co., Ltd., Montreal, \$2,724,717; Marine Industries, Ltd., Sorel, Que., \$240,000; Star Shipyard (Mercers), Ltd., New Westminster, B. C., \$108,000.

Mechanical Transport—J. S. Innes, Toronto, \$96,744; Ross Cycle & Sports, Toronto, \$48,673; Arlington Cycle & Sports, Ltd., Montreal, \$31,806.

Aircraft—Canadian Pratt & Whitney Aircraft Co., Longueuil, Que., \$979,414.

Electrical Equipment—Northern Electric Co., Ottawa, \$180,372; Outboard Marine & Mfg. Co. of Canada, Ltd., Peterborough, \$322,166.

Machinery—Vivian Engine Works, Ltd., Vancouver, B. C., \$84,608; Wm. N. Brennan, London, \$38,352.

Fire Fighting Equipment—Dominion Merchants Co., Ltd., Montreal, \$94,600.

Construction Projects—Duranceau & Duranceau, Montreal, \$81,000; L. G. Ogilvie & Co., Ltd., Montreal, \$358,556; The General Engineering Co. (Canada), Ltd., Toronto, \$608,835.

## 3,000,000 Tons Of Steel Capacity Idle

••• The steel industry had sufficient unused capacity in reserve during the fourth quarter of 1940 to meet demands for additional output at the rate of at least 3,000,000 tons annually, although steel production during that quarter broke all records, according to the American Iron and Steel Institute.

This unused capacity was spread throughout the industry and is available as needs arise either for defense or for regular commercial purposes. Of the total capacity not in use during the last three months about 60 per cent was in plants of 1,000,000 tons of capacity and over. The other 40 per cent was in smaller plants with less than 1,000,000 tons of capacity.

The larger steel companies have a wider range of products available for defense work, and consequently they are operating at somewhat higher rates. The average operating rate for the larger companies in the last quarter of the year was 97 per cent of capacity, and for the smaller companies it was 86 per cent. There are 270 companies in the steel industry, 70 of which are producers of ingots.

Many of the smaller companies make a limited range of steel products, some of which have not been required in large quantities thus far in the defense program. As a result the unused facilities of these companies stand as a "cushion" if increased pressure for steel is felt.

## Wisconsin Court Bans Mass Picketing

Milwaukee

••• The Wisconsin state supreme court, in a unanimous decision, upheld the validity of a Wisconsin state employment relations board order against a local Milwaukee CIO union growing out of a strike at the Allen-Bradley Co. plant. The order forbade mass picketing of the plant and found 14 union members guilty of unfair labor practices because of threats and violence against nonstrikers. The supreme court held that so long as the national labor relations board has not taken jurisdiction the Wisconsin board has authority to act as it did. Union officials indicate that an appeal will be made to the United States supreme court.

## Reuther Plane Plan Called Impractical

Washington

••• The plan of Walter Reuther, UAW head, to utilize idle automobile plant facilities to produce 500 pursuit planes daily is highly impractical in the estimation of the machine tool industry. This view was expressed by members of the National Machine Tool Manufacturers Association at a meeting it held in Washington, Jan. 7-8.

It was pointed out that machinery in automobile plants is suitable only for the production of cars and that equipment that is idle is unused chiefly because it is outmoded and inefficient. An opinion was expressed that for the same reason the defense commission's project to use idle facilities in "ghost" towns is impractical.

It was disclosed by an official of the association that a study is being made by one of its members to determine precisely how much and when additional equipment will be needed within the next few years, the purpose being to develop orderly expansion. This undertaking, it was stated, will be simplified now that the defense commission has made definite plans at the request of the association to define more accurately the actual machine tool requirements for national defense.

It was stated at the meeting that conditions in the industry had become "chaotic and were rapidly growing worse" by reason of indecision and the quick changes made in the defense program.

"We cannot expand a plant simply because some government official tells us verbally," it was declared, "but that is what we are expected to do. We need actual orders; we need to know far in advance what we will be expected to produce; and we need a better system of priority because at this moment nearly all orders for machine tools are marked A-1 priority."

It was stated that there is a gage shortage, annual demand having risen to \$16,000,000 from \$4,000,000.



## 62% of '41 Budget For U. S. Defense

Washington

• • • The \$17.5 billion budget submitted to Congress last week by President Roosevelt included an estimated expenditure of \$10,811,000,000 for national defense, or 62 per cent of all proposed government expenditures for the new fiscal year beginning July 1.

With defense expenditures during the last six months amounting to \$1,750,000,000, Mr. Roosevelt estimated that actual expenditures for defense within a three-year period will be \$25 billion. The budget proposed these expenditures for the new fiscal year:

War Department—\$5,915,100,600 for defense purposes as compared with an estimated \$3,766,165,700 for the current fiscal year.

The 1942 estimates includes \$450,000,000 for expediting production of defense supplies and equipment; \$10,000,000 for educational orders and munitions production; \$13,500,000 for defense housing; \$1,100,000,000 for ordnance service and supplies, and \$80,000,000 for seacoast defenses.

Navy Department—\$3,402,394,000 for defense purposes as compared with an estimated \$2,086,303,300 for the current fiscal year. The 1942 estimates includes \$1,475,000,000 for replacement of naval vessels, of which \$1,100,000,000 is for construction and machinery, and \$375,000,000 for armor, armament and ammunition; \$145,000,000 for naval alterations and repairs; \$550,000,000 for naval aviation; \$250,000,000 for public works at yards and docks; \$170,000,000 for ordnance and ordnance stores, and \$195,000,000 for ship maintenance.

## Coal Output Found Adequate for Defense

Pittsburgh

• • • With a ton of coal going further than it did in World War days, when it took 3 lb. of coal to produce one kw. of electricity as against 1 lb. now, and with railroads having stepped up the efficiency of coal by about 40 per

## Carmichael To Be "Knudsen of Canada"

Oshawa, Ont.

• • • Drafted by the Canadian government, Harry J. Carmichael, vice-president and general manager of General Motors of Canada, Ltd., has resigned that position to assume a key position in the wartime mobilization of Canadian industry and become what has been described as the "Knudsen of Canada."

Relinquishing command of four large factory plants of General Motors of Canada, Ltd., at Oshawa, Windsor, St. Catharines and Regina, Mr. Carmichael will leave at once for Ottawa to assume production responsibilities "as wide as the whole industry of the Dominion," R. S. McLaughlin, president of the Canadian corporation, said.

cent, present operations of bituminous coal mines are entirely adequate to supply defense needs, Ralph E. Jamieson, president, Western Penna. Coal Operators Association, said here last week.

Even though present operations in the bituminous coal mines are breaking 10 year records, output is still considerably below capacity, according to coal experts.

## Westinghouse Ready to Sign Written Contract

• • • Westinghouse Electric & Manufacturing Co. this week said that it is ready to meet and sign a contract with the United Electrical, Radio & Machine Workers, a CIO affiliate, following a demand for a wage increase. The union is seeking a wage increase of 10c. an hour from both Westinghouse and General Electric Co.

## Bauxite Ore Arriving From East Indies

Mobile, Ala.

• • • Bauxite ore to supply the aluminum plant being constructed at Lister, Ala., by the Reynolds Metals Co. is arriving here from the Dutch East Indies. Shipping circles said two shiploads, totaling 6800 tons, already have been unloaded and shipped to the plant site by rail.

## U. S. Steel, C. I. O. To Discuss Wages

Pittsburgh

• • • Philip Murray, SWOC and CIO president, will meet "informally" with U. S. Steel, Crucible Steel, and Jones & Laughlin Steel officials next week when he will discuss the wage question, liberalization of vacations, closed shop and check off demands, and provisions for speeding up the disposal of grievances.

As mentioned before—IRON AGE, Nov. 28, 1940, page 79C—this initial move will be on an informal basis in order to escape invoking the legal machinery as set up in the contracts. A formal notification would have meant that the contract would be voided in case no agreement would have been reached within 20 days of the date of notification.

It is understood William Beye, vice-president, U. S. Steel Corp. of Delaware, will meet with Murray on Jan. 21. The latter will meet with Crucible officials on Jan. 23, and it is said H. E. Lewis, board chairman, Jones & Laughlin Steel Corp., will talk things over with Murray Jan. 25.

Murray, it is understood, has called for the informal conferences following a long line of demands made upon him by local SWOC lodges for higher wages, check off, etc.

## Pittsburgh Traffic Club Dinner to Be Held Jan. 24

Pittsburgh

• • • M. V. Clement, president, Pennsylvania Railroad, will be principal speaker and B. F. Fairless, president, U. S. Steel Corp., will be toastmaster at the 40th annual Traffic Club of Pittsburgh dinner to be held here Friday, Jan. 24. About 2000 industrial leaders and transportation executives are expected to attend.

A. C. Schweitzer, traffic manager, U. S. Steel Corp., is general chairman and Robert H. Miller, general freight agent, Pennsylvania Railroad and president of the Traffic Club, will preside.

## Buick Shifts 40 Key Men For Defense

••• Harlow H. Curtice, president of Buick, announces extensive changes in Buick's executive personnel to accommodate plans of this division of General Motors Corp. to build aircraft engines for the national defense. A separate Buick organization for the production of aircraft engines has been created which will operate as a division of the company and will be under direct Buick control. A wide list of promotions to fill vacancies created by the naming of aircraft engine plant personnel, has also been announced. More than 40 key production and engineering technicians and members of the management staff are affected, with the shift providing the nucleus of the eventual larger organization which will undertake aircraft engine manufacture. The changes are effective immediately.

### Headed By D. E. Williams

Heading the new defense project organization will be D. E. Williams, formerly Buick comptroller, as operating manager, and J. G. Hammond as general manufacturing manager. On the management staff will be Harry C. Young as comptroller and John Bobay as assistant comptroller.

Mr. Hammond, formerly general superintendent of Buick, is a production expert of many years experience with this manufacturer. He laid out and tooled the Buick engine plant which now has a capacity of upward of 2000 automobile engines daily and has been the technician in charge of Buick's plant development and expansion for the past several years.

In directing the manufacture of aircraft engines, Mr. Hammond will be assisted by I. H. Larkin, formerly superintendent of Buick tool manufacture, who becomes assistant manufacturing manager, R. H. Archer, formerly chief of standards, as general superintendent, and James O'Neil, formerly assistant superintendent of the gear and axle plant, as assistant general superintendent.

Buick's chief inspector, C. N. Ofield, takes over the duties of chief inspector in the aircraft organization, while H. E. Harden-

brook, formerly assistant works engineer, becomes works engineer of the new plant, and R. E. Mitchell, formerly assistant master mechanic, becomes master mechanic. C. L. Foreman, formerly assistant chief metallurgist, becomes chief metallurgist of the aircraft division. Mr. Ofield returns to an old-time war duty, having been chief inspector of Liberty motors when Buick produced aircraft engines in 1918.

Engineering will be under the direction of Buick's chief engineer, Charles A. Chayne, with Harry Golden named as assistant chief engineer of the new organization, Mr. Chayne retaining his function as head of Buick's engineering department. Among other Buick engineers transferred to the new project are E. E. Harts on engine test, and F. McNamara on specifications and engineering accounting.

L. A. Stewart will direct purchases for the new aircraft plant also retaining his duties as Buick purchasing agent, and will be assisted by B. W. Stickney, long-time buyer in the purchasing department.

Personnel activities will be directed by C. E. Wooliever, who has long been associated in this department at Buick, while D. B. Barrett of the traffic department is assigned as traffic manager for the organization.

A. G. MacDougall becomes assistant master mechanic of the new organization and George Kaufman takes over accounting functions.

Other promotions in the Buick organization as a result of the shift were announced as follows: Walter N. Larke, formerly assistant general superintendent, becomes general superintendent, replacing Mr. Hammond. B. H. Newell, formerly superintendent of the foundry, becomes assistant general superintendent with William G. Mixer becoming foundry superintendent.

Succeeding Mr. Archer as chief of standards will be John F. Kennedy, formerly assistant, with Ian McClure and R. P. Dunham assistants in the standards department. John E. Weckler is named assistant superintendent of the foundry.

Succeeding Mr. Ofield as chief inspector is Albert R. Bender, his former assistant, while R. G. Thomas, formerly chief of final assembly inspection takes Mr. Bender's post. Fred W. Moore becomes superintendent of the tool manufacturing department with Norman Harvey, formerly a foreman in the department, as assistant superintendent. Albert A. Miller succeeds Mr. Hardenbrook as assistant works engineer while Waldemar Velguth, formerly supervisor of specifications, becomes assistant chief metallurgist.

Promoted to assistant superintendent of the axle plant, replacing Mr. O'Neil is John A. Hoholik; while Homer Schultz becomes assistant master mechanic, Wayne Haviland is named to special assignment in the master mechanic's division and Don Taylor, chief inspector in the assembly plant.

In the comptroller's office the post vacated by Mr. Williams will be filled by Ivan L. Wiles.

## Defense Program Alters Studebaker Staff

••• Paul G. Hoffman, president of The Studebaker Corp., announces two shifts in executives as part of the company's participation in national defense production and intensification of its passenger car and truck sales campaign. George D. Keller, vice-president in charge of sales, has been appointed assistant to H. S. Vance, chairman, who is directing Studebaker's defense manufacturing program. K. B. Elliott, vice-president of Studebaker and Mr. Hoffman's assistant for several years, was named to succeed Mr. Keller.

## 1941 Automobile Show May Be Cancelled

Detroit

••• Action leading to cancellation of the 1942 model National Automobile Show is being considered by the industry, it has been learned. Prospective cancellation of the show is regarded as indicative of the uncertainty regarding new models and when they will be brought out.



• **John W. Brussel** has been named president and general manager of the Steel Materials Corp., Detroit, following his resignation as factory manager of the Bendix Aviation Corp. plant at South Bend, Ind. Before going with Bendix, Mr. Brussel was production manager of the Federal Mogul Corp., Detroit.

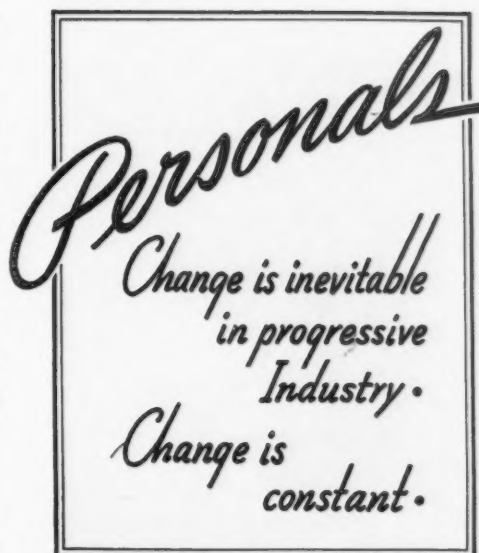
• **Henry A. Roemer**, president, Pittsburgh Steel Co., Pittsburgh, has been elected a trustee of Bucknell University, succeeding the late John M. Wilson, of Pittsburgh.

• **James A. Gillis**, former member of the New York order department of the American Steel & Wire Co., has been appointed supervisor of warehouses, a newly created position with headquarters in the main office in Cleveland.

• **Edward D. Gangwere** has been appointed director of equipment, Westinghouse Electric & Mfg. Co., East Pittsburgh. Mr. Gangwere has been with Westinghouse since 1903. He was made supervisor of equipment and methods in 1922 and chief inspector in 1931. Since 1937 he has been in the works equipment, inspection, and test department.

• **Wilbur L. Young**, manufacturing engineer of the transformer department of the Pittsfield, Mass., works of the General Electric Co., has been made manufacturing engineer of the company's new gun director manufacturing plant. **Burton S. Francis**, superintendent of the regulator department, has been made superintendent of the new plant. **Alfred W. Hough**, superintendent of the distribution transformer department, will take Mr. Young's place and **Ward E. Krone**, that of Mr. Francis.

• **D. S. Mix**, who has been identified with the publicity department of General Electric Co., Schenectady, since his graduation from the Sheffield Scientific School of Yale University in 1917, has been assigned the responsibility for media and publishers relations, formerly handled by the late F. R. Davis. Since 1932, Mr. Mix has devoted his time to publicity department training programs, personnel, and special assignments, which he will continue to handle.



• **Robert L. Lerch** has been appointed general sales manager of Haynes Stellite Co., unit of Union Carbide and Carbon Corp. Mr. Lerch has been associated with Haynes Stellite Co. since 1924. During the World War he served in the U. S. Marine Corps. After the war he returned to Lehigh University from which he was graduated in chemical engineering in 1922. He then spent a year and a half in various plant departments of the Bethlehem Steel Co.'s Lehigh plant, Bethlehem, Pa. He joined the Haynes Stellite Co. as a sales engineer in the New York

district, later transferring to the Chicago territory, and next serving as district sales manager at Los Angeles and at Houston. Since 1929, he has been advertising manager and assistant to the general sales manager.

• **E. L. Harcourt** has severed his connection with Hiram Swank's Sons, Johnstown, Pa.

• **L. C. Stowell**, executive vice-president of Underwood Elliott Fisher Co., has been elected to the board of the Pitney-Bowes Postage Meter Co.

• **J. C. Schmidtbauer**, northwestern district manager of the Westinghouse Electric Supply Co., Chicago, has been elected a vice-president of the company.

• **G. Donald Spackman**, who has been general superintendent of Lukens Steel Co., Coatesville, Pa., since 1936, has been appointed general manager of that company and its subsidiaries. He joined the company in 1919, was appointed fuel engineer the following year and in 1925 became superintendent of the flanging department. Four years later he was made assistant general superintendent of Lukens Steel and in 1930, president of the Lukenweld division.



**R. L. LERCH**, general sales manager, Haynes Stellite Co.



**G. DONALD SPACKMAN**, general manager of Lukens Steel Co.

• **C. T. Hapgood** and **R. C. Garvey** have been appointed assistant district sales managers of Jones & Laughlin Steel Corp.'s Los Angeles and San Francisco district sales offices, respectively.

Mr. Hapgood started with Jones & Laughlin as an inspector in the Aliquippa tube mills in 1930. In 1934 he was transferred to the tubular products sales department and in 1935 went to the Los Angeles district sales office.

Mr. Garvey was connected with several Cleveland firms before going with Jones & Laughlin in 1937 in the tubular products sales department. In 1938 he was transferred to the Los Angeles district sales office where he remained until his present appointment.

• **Louis R. Botsai**, for the past three years sales manager of the small motor division at Lima, Ohio, of Westinghouse Electric & Mfg. Co., and before that for eight years sales manager of gearing apparatus at the Nuttall works, has been appointed manager of the gearing department at the East Pittsburgh division. He joined Westinghouse as a student engineer in 1915 and in five years attained the position of general manager of steel mill electrification at East Pittsburgh.



**LOUIS R. BOTSAI**, manager of the gearing department, East Pittsburgh division, Westinghouse Electric & Mfg. Co.



**CHARLES S. TRAER**, whose appointment as president of Acme Steel Co., Chicago, was announced in these columns last week.

• **Ray H. Morris**, who has been associated with Hardinge Brothers, Inc., Elmira, N. Y., since 1932, has been elected vice-president and will be in charge of the company's Hartford office at 7 South Main Street, West Hartford. He served his apprenticeship in the machine shop of Henry A. Palmer, Westfield, Mass., and subsequently served in various mechanical and administrative capacities with the



**RAY H. MORRIS**, vice-president, Hardinge Brothers, Inc.

Foster Machine Co., H. B. Smith Mfg. Co., Bausch Machine Tool Co., Pratt & Whitney Co., and Davenport Machine Tool Co.

• **Homer B. West** has been appointed manager of manufacturing in the transformer division of Westinghouse Electric & Mfg. Co., Sharon, Pa. He joined the company in 1919 in the power engineering department. In 1921 Mr. West was transferred to the transformer engineering department and since 1935 has been in charge of instrument and regulator engineering.

• **H. I. Dixon**, for seven years metallurgical sales engineer in the Ohio and western Pennsylvania territories for Electro-Alloys Co., Elyria, Ohio, has been appointed assistant general manager of Park Chemical Co., Detroit. A graduate of the University of Michigan, Mr. Dixon's career includes service with Crucible Steel Co. of America at Pittsburgh for six years, General Motors Corp., and New Jersey Zinc Co.

• **D. C. Mills**, who has been associated with Bethlehem Steel Co., since his graduation from the United States Naval Academy in 1923, has been made assistant manager of compensation and safety. He will be assistant to W. F. Ames, manager of that department. Before being transferred to the company's Bethlehem plant in 1939, he held various positions at the Sparrows Point plant.

• **A. R. Rutter** has been appointed assistant manager of the engineering department of Westinghouse Electric & Mfg. Co. meter division at Newark, N. J. Mr. Rutter joined Westinghouse in 1918 in the engineering department at East Pittsburgh and when that department was transferred to Newark in 1928 he became section engineer of watthour meters, which position he held until his present appointment.

**T. D. Barnes**, a meter engineer since 1926, will become the new section engineer of watthour meters. He is a graduate of the Bliss Electrical School.

**J. M. Heggy** was appointed instrument section sales manager for the meter division. He joined Westinghouse as a junior graduate student in 1930 and was as-



signed to work in the meter division after his graduation from Purdue University in 1931.

• **Orville T. Barnett** has joined Metal & Thermit Corp., New York, as engineer of tests in its welding electrode department. He was formerly associated with Carnegie-Illinois Steel Corp. in the metallurgical control department and later with Black, Sivalls & Bryson, where he first did research and welding control work.

• **George L. Norris**, chief metallurgical engineer of Vanadium Corp. of America, was tendered a luncheon on Jan. 10 by the officers and department heads of the company to celebrate the 32nd anniversary of his association with the company and its predecessor and also the 75th anniversary of his birth on Jan. 11.

• **Paul R. Tappan**, president of Tappan Stove Co., has been selected to serve as president of Manufacturers' Club of Mansfield, Ohio, for the coming year. He succeeds **C. A. Hines**, president of Farm Tools, Inc.

• **Harold F. Falk**, former production manager of the Falk Corp., Milwaukee, has been appointed general superintendent succeeding his father, **Harold S. Falk**, who was made president of the firm last year. Harold Falk graduated from the engineering college of the Wisconsin University and after receiving his degree was put in charge of the Falk welding department. Later he was supervisor of shop production and schedules and in 1940 was appointed production manager.

• **Alfred E. Bateson**, who has been succeeded as manager of purchases for Allis-Chalmers Mfg. Co., Milwaukee, by **Fred Haker**, was honored by the Foreman's club of that company with the gift of a gold watch on the occasion of his retirement after 50 years of service. Bateson entered the purchasing department of the old Fraser & Chalmers Co. as an office boy. He later went to work for the E. P. Allis Co., Milwaukee, and when the firm became known under its present title he continued to rise in the purchasing department, becoming manager of the division 22 years ago.

## Obituary

• **Fred R. Davis**, a founder of the Audit Bureau of Circulations and advertising space buyer for the General Electric Co., Schenectady, for 35 years, died Dec. 26 at his home in that city after a long illness. He was 64 years old. For many years he supervised the expenditure of more than a million dollars annually for newspaper and magazine space.

A man of scientific training himself, Mr. Davis was a pioneer advocate of accurate measurement in advertising and helped found the Audit Bureau of Circulations in 1914. He served as a director from that date until his death and since 1927 had also been first vice-president of the organization.

Mr. Davis was born in Adams, Mass., attended Union College in Schenectady, and was graduated from Worcester Polytechnic Institute in 1900 with the degrees of B.S. and M.S. in engineering. In 1901, he entered the G-E organization as a test student and in 1902 went to Fort Wayne, Ind., as publicity manager of the Fort Wayne Electric Co. In 1905 he joined the G-E advertising department in Schenectady.

• **Charles H. Brandt**, president of the old National Iron & Wire Co., Cleveland, from 1912 to his retirement in 1930, died Dec. 22 at St. Joseph's Hospital in Lorain. He was 76 years old.

• **Alfred E. Bickel**, supervisor of the engineering specifications department at Harnischfeger Corp., Milwaukee, died Dec. 25 after a few months' illness. He was born in Milwaukee and had been associated with Harnischfeger since 1906.

• **David Milne**, machine shop superintendent of Farrel-Birmingham Co., Inc., Ansonia, Conn., for the past 21 years, died at his home in Milford, Conn., on Dec. 25, aged 63 years. He served his machinist apprenticeship in Scotland and in 1900 went to Canada, where he worked as a machinist in a railroad locomotive plant. He came to the United States and in 1907 started work at the Farrel Foundry & Machine Co. as a vertical

boring mill operator. In 1916 he was made foreman and in 1920 became superintendent of the machine shop.

• **Carlyle S. Greene**, vice-president and purchasing agent of the Green Mfg. Co., Racine, Wis., died suddenly of a heart attack in his home there Dec. 23. He was born in Racine in 1899 and after graduating from the Lewis Technical School, Chicago, joined the firm founded by his father in 1915. He was elected vice-president 12 years ago and at the time of his death was a director of the firm.

• **E. L. Schaffer**, formerly New York district sales manager for Page Steel & Wire division of the American Chain & Cable Co., Inc., died at Phoenix, Ariz., on Dec. 27 after a long illness. Mr. Schaffer had been associated with the Page Steel & Wire division for a number of years as district sales manager at New York and before that he held the same position at Pittsburgh. He retired in September, 1939, because of ill health.

• **Charles S. McKinley**, who for many years was Philadelphia district sales manager for the Republic Steel Corp., died last month at his home in that city.

• **Reuben I. Wright**, formerly a director and chief engineer of Electric Controller & Mfg. Co., Cleveland, died suddenly Jan. 4 following a heart attack at his residence. Born in Sedalia, Mo., 64 years ago, Mr. Wright was graduated in 1899 from Harvard University and then soon joined the newly formed Electric Controller & Mfg. Co. He retired in 1920.

• **Nicholas Christensen**, sales manager of the mining division of Cardox Corp., Chicago, and widely known in the coal mining field, died Dec. 26 at Rochester, Minn., aged 59 years. Mr. Christensen was born in Rebe, Denmark, and came to this country at an early age. After a long career in the sales activities, handling a diversity of products he finally devoted all his time to the sales and promotion of Cardox products.

• **Frank E. Randall**, a pioneer in the manufacture of dial gages and indicators used in machine shops, died Jan. 9 at the Waltham, Mass., Hospital. Mr. Randall was a native of North Easton, Mass.

## Production of Semi-finished and Finished Steel For Sale in November Was 4,760,948 Tons

• • • In the first 11 months of 1940 the steel industry produced 43,671,187 net tons of semi-finished and finished steel for sale, according to the monthly report of the American Iron and Steel Institute. The November output was 4,760,948 tons, of which 280,953 tons was sold to members of the industry for further conversion.

Output of one product, sheet piling, in November

was slightly in excess of 100 per cent of capacity. Total sheet production was 97.4 per cent of capacity. Illustrative of the situation in tin plate is a 73.8 per cent operation of cold reducing units and only 22.9 per cent operation of hot mills.

The amount of steel made for export in November was 562,587 tons and the total for 11 months in this category was 6,969,339 tons.

AMERICAN IRON AND STEEL INSTITUTE														
Capacity and Production for Sale of Iron and Steel Products														
November - 1940														
	Number of companies	Items	Annual Capacity Net tons	PRODUCTION FOR SALE—NET TONS										
				Current Month				To Date (11 Months - 1940)						
				Total	Per cent of capacity	Shipments		Total	Per Cent of capacity	Shipments				
						Export	To members of the industry for conversion into further finished products			Export	To members of the industry for conversion into further finished products			
STEEL PRODUCTS	Ingots, blooms, billets, slabs, sheet bars, etc.	34	1	xxxxxx	540,222	xxx	202,502	123,304	5,056,332	xxx	2,372,787	1,071,844		
	Heavy structural shapes	8	2	5,205,300	373,825	87.5	36,113	xxxxxx	2,817,737	59.1	374,070	xxxxxx		
	Steel piling	4	3	328,000	26,988	100.3	1,950	xxxxxx	194,938	64.9	19,523	xxxxxx		
	Plates—Sheared and Universal	20	4	6,095,450	432,680	86.5	63,991	2,312	3,747,524	67.2	572,186	19,323		
	Skelp	8	5	xxxxxx	91,331	xxx	18,198	41,414	764,660	xxx	163,714	280,099		
	Rails—Standard (over 60 lbs.)	4	6	3,647,600	95,813	32.0	11,894	xxxxxx	1,376,858	41.2	189,103	xxxxxx		
	Light (60 lbs. and under)	6	7	306,800	14,134	56.1	5,731	xxxxxx	117,007	41.7	44,949	xxxxxx		
	All other (Incl. girder, guard, etc.)	2	8	118,000	4,144	42.8	892	xxxxxx	25,253	23.4	4,621	xxxxxx		
	Splice bar and tie plates	15	9	1,300,200	21,746	20.4	939	xxxxxx	455,022	38.2	9,699	xxxxxx		
	Bars—Merchant	35	10	xxxxxx	495,011	xxx	46,946	50,884	4,268,501	xxx	664,142	339,975		
	Concrete reinforcing—New billet	16	11	xxxxxx	120,777	xxx	14,773	xxxxxx	1,193,211	xxx	248,803	xxxxxx		
	Rerolling	18	12	xxxxxx	9,429	xxx	884	xxxxxx	133,000	xxx	8,860	xxxxxx		
	Cold finished—Carbon	18	13	xxxxxx	77,080	xxx	4,073	xxxxxx	637,836	xxx	20,776	xxxxxx		
	Alloy—Hot rolled	16	14	xxxxxx	118,535	xxx	11,591	11,287	928,931	xxx	82,096	70,733		
	Cold finished	15	15	xxxxxx	10,246	xxx	961	xxxxxx	88,458	xxx	4,578	xxxxxx		
	Hoops and baling bands	5	16	xxxxxx	6,756	xxx	514	xxxxxx	93,088	xxx	8,484	xxxxxx		
	TOTAL BARS	54	17	12,389,265	837,834	82.4	79,742	62,171	7,343,025	64.7	1,037,739	410,708		
	Tool steel bars (rolled and forged)	15	18	110,220	7,685	85.0	933	xxxxxx	65,664	65.1	5,913	xxxxxx		
	Pipe and tube—B. W.	13	19	1,851,860	128,400	84.5	7,481	xxxxxx	1,017,101	60.0	71,836	xxxxxx		
	L. W.	10	20	1,246,340	32,947	32.2	2,540	xxxxxx	325,822	28.6	30,545	xxxxxx		
	Electric weld	5	21	735,520	22,097	36.6	2,464	xxxxxx	257,021	38.2	27,332	xxxxxx		
	Seamless	15	22	3,159,840	152,102	58.7	14,303	xxxxxx	1,631,708	56.4	191,574	xxxxxx		
	Conduit	6	23	151,145	8,657	69.8	142	xxxxxx	72,267	52.2	1,650	xxxxxx		
	Mechanical Tubing	13	24	554,825	33,220	73.0	3,157	xxxxxx	273,446	53.8	22,607	xxxxxx		
	Wire rods	18	25	xxxxxx	107,394	xxx	14,334	19,738	1,120,025	xxx	320,702	174,939		
	Wire—Drawn	37	26	2,255,210	165,348	89.5	11,822	1,392	1,387,121	67.2	155,580	11,022		
	Nails and staples	19	27	1,091,690	60,656	67.7	3,265	xxxxxx	577,053	57.7	54,947	xxxxxx		
	Barbed and twisted	16	28	438,270	17,924	49.8	4,518	xxxxxx	192,261	47.9	47,871	xxxxxx		
	Woven wire fence	15	29	772,790	14,874	23.5	131	xxxxxx	207,584	29.3	1,943	xxxxxx		
	Bale ties	11	30	119,050	3,925	40.2	29	xxxxxx	63,546	58.3	294	xxxxxx		
	All other wire products	5	31	27,030	409	18.4	-	xxxxxx	4,867	19.7	-	xxxxxx		
	Fence posts	13	32	147,485	4,006	33.1	15	xxxxxx	49,965	37.0	862	xxxxxx		
	Black plate	12	33	653,295	24,090	44.9	4,141	73	316,631	52.9	43,094	56,084		
	Tin plate—Hot rolled	9	34	1,201,960	22,572	22.9	356	xxxxxx	404,514	36.8	75,132	xxxxxx		
	Cold reduced	10	35	2,930,860	177,529	73.8	9,402	xxxxxx	2,081,921	77.6	308,751	xxxxxx		
	Sheets—Hot rolled	26	36	xxxxxx	584,715	xxx	34,914	12,540	5,163,064	xxx	476,733	144,618		
	Galvanized	16	37	xxxxxx	147,142	xxx	10,629	xxxxxx	1,395,551	xxx	145,138	xxxxxx		
	Cold rolled	18	38	xxxxxx	267,525	xxx	4,652	xxxxxx	2,181,858	xxx	69,688	xxxxxx		
	All other	15	39	xxxxxx	60,263	xxx	1,594	xxxxxx	539,734	xxx	21,724	xxxxxx		
	TOTAL SHEETS	27	40	13,255,610	1,059,645	97.4	51,789	12,540	9,280,207	76.5	713,284	144,618		
	Strip—Hot rolled	24	41	3,525,110	155,967	53.9	7,789	18,009	1,370,176	42.5	81,944	159,824		
	Cold rolled	35	42	1,313,360	83,076	77.1	1,173	xxxxxx	701,644	58.4	15,824	xxxxxx		
	Wheels (car, rolled steel)	5	43	424,385	17,305	49.7	45	xxxxxx	171,777	44.2	2,529	xxxxxx		
	Axles	5	44	472,280	14,037	36.2	434	xxxxxx	94,211	21.8	2,319	xxxxxx		
	Track spikes	11	45	327,275	7,948	29.6	360	xxxxxx	97,312	32.5	3,903	xxxxxx		
All other	3	46	9,100	218	29.2	12	xxxxxx	8,987	107.9	12	xxxxxx			
TOTAL STEEL PRODUCTS	134	47	xxxxxx	4,760,948	xxx	562,587	280,953	43,671,187	xxx	6,969,339	2,328,461			
Estimated total steel finishing capacity based on a yield from ingots of 68.9 %				-	48	53,946,300	xxxxxx	101.2	xxxxxx	xxxxxx	83.7	xxxxxx		
IRON PRODUCTS	Pig iron, ferro manganese and spiegel	26	49	xxxxxx	595,351	xxx	7,180	206,776	5,398,328	xxx	491,061	1,507,997		
	Ingot moulds	4	50	xxxxxx	60,456	xxx	81	xxxxxx	449,952	xxx	4,451	xxxxxx		
	Bars	10	51	160,600	3,139	23.8	-	56	29,530	20.1	364	1,772		
	Pipe and tubes	3	52	109,377	4,649	51.8	158	xxxxxx	39,535	39.5	1,008	xxxxxx		
	All other	3	53	71,180	1,693	29.0	347	-	11,607	17.8	2,523	2,326		
TOTAL IRON PRODUCTS (ITEMS 51 to 53)				12	54	276,247	9,481	41.8	505	56	80,672	31.9	3,895	4,098

Total number of companies included..... 153

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current month 4,479,995 N.T.: 101.2 % of Finishing Capacity.  
To date 41,342,726 N.T.: 83.7 % of Finishing Capacity.  
The above tonnages represent 68.9 % of the ingots produced by companies whose products are included above.



# Metal Working Activity

. . . Latest Data Assembled by The Iron Age

From Recognized Sources. In Net Tons.

	Oct. 1940	Sept. 1940	Oct. 1939	10 Months 1940	10 Months 1939
<b>Steel Ingots:</b>					
Monthly output <sup>a</sup> .....	6,461,898	5,895,232	6,080,177	52,663,361	39,615,189
Average weekly output <sup>a</sup> .....	1,458,668	1,377,391	1,372,500	1,208,707	912,162
Per cent of capacity <sup>a</sup> .....	96.10	90.75	89.75	79.64	59.65
<b>Pig Iron:</b>					
Monthly output <sup>b</sup> .....	4,445,961	4,176,527	4,062,901	37,998,074	26,929,950
<b>Raw Materials:</b>					
Coke output <sup>c</sup> .....	5,202,764	4,899,201	4,779,100	46,251,334	34,379,800
Lake ore consumed <sup>d</sup> .....	6,777,509	6,352,548	5,903,192	56,313,901	37,346,340
Scrap iron consumed <sup>e</sup> .....	4,740,960	4,341,120	4,266,080	37,872,800	27,958,560
<b>Castings:</b>					
Malleable, orders <sup>e</sup> .....	71,129	53,079	63,835	440,652	391,726
Steel, orders <sup>e</sup> .....	112,327	83,545	119,687	606,647	521,032
<b>Finished Steel:</b>					
Trackwork shipments <sup>a</sup> .....					
Fabricated shape orders <sup>f</sup> .....	233,115	225,494	118,841	1,395,248	1,121,350
Fabricated plate orders <sup>g</sup> .....	*	*	37,766	*	307,746
U. S. Steel Corp. shipments <sup>h</sup> .....	1,572,408	1,392,838	1,345,855	12,006,135	8,901,942
<b>Fabricated Products:</b>					
Automobile production <sup>b</sup> .....	493,223	269,108	313,392	3,498,435	2,773,365
Steel furniture shipments <sup>g</sup> .....	3,089,852	2,391,691	2,149,691	22,292,569	18,262,910
Steel boiler orders <sup>g</sup> (sq. ft.) .....	1,707,956	3,726,433	1,089,228	13,948,378	9,742,487
Locomotives ordered <sup>i</sup> .....	30	57	34	388	247
Freight cars ordered <sup>i</sup> .....	11,786	9,470	11,220	45,272	44,843
Machine tool index <sup>j</sup> .....	96.8	94.9	84.9	93.1†	65.6
Foundry equipment index <sup>k</sup> .....	264.0	161.2	*	169.21†	*
Gear sales index .....	216	183	141	147†	100.4
<b>Non-Ferrous Metals: (U. S. only)</b>					
Lead shipments <sup>l</sup> .....	62,496	53,456	66,060	488,878	445,828
Lead stocks <sup>l</sup> .....	35,386	41,292	73,963	.....	.....
Zinc shipments <sup>m</sup> .....	64,787	66,824	73,327	567,065	481,097
Zinc stocks <sup>m</sup> .....	22,600	30,965	72,405	.....	.....
Tin deliveries <sup>n</sup> .....	13,238	12,779	6,765	104,870	58,979
Refined copper deliveries <sup>o</sup> .....	103,771	96,485	*	786,732	*
Refined copper stocks <sup>o</sup> .....	164,618	185,313	*	.....	*
<b>Exports:</b>					
Total iron and steel <sup>p</sup> .....	1,238,171	1,221,052	662,879	10,097,129	5,454,891
All rolled and finished steel <sup>p</sup> .....	446,874	402,997	179,318	3,793,784	1,561,595
Semi-finished steel <sup>p</sup> .....	428,238	462,732	39,761	2,623,541	196,436
Scrap <sup>p</sup> .....	289,997	255,608	377,188	3,000,210	3,470,173
<b>Imports:</b>					
Total iron and steel <sup>p</sup> .....	4,442	2,598	21,492	58,530	319,576
Pig iron <sup>p</sup> .....	661	1,830	5,686	11,361	38,640
All rolled and finished steel <sup>p</sup> .....	259	451	4,808	14,075	166,839

Source of data: <sup>a</sup> American Iron and Steel Institute; <sup>b</sup> THE IRON AGE; <sup>c</sup> Bureau of Mines; <sup>d</sup> Lake Superior Iron Ore Association; <sup>e</sup> Bureau of the Census; <sup>f</sup> American Institute of Steel Construction; <sup>g</sup> United States Steel Corp.; <sup>h</sup> Preliminary estimates by THE IRON AGE—Final figures from Bureau of the Census, U. S. only; <sup>i</sup> Railway Age; <sup>j</sup> National Machine Tool Builders Association; <sup>k</sup> Foundry Equipment Manufacturers Association; <sup>l</sup> American Bureau of Metal Statistics; <sup>m</sup> American Zinc Institute; <sup>n</sup> New York Commodity Exchange; <sup>o</sup> Copper Institute; <sup>p</sup> Department of Commerce; <sup>q</sup> Institute of Scrap Iron and Steel; <sup>r</sup> American Gear Manufacturers Association.

\* Not available. † Monthly averages.

# The Iron Age Comparison of Prices

Advances Over Past Week in Heavy Type; Declines in Italics

	Jan. 14, 1941	Jan. 7, 1941	Dec. 16, 1940	Jan. 16, 1940		Jan. 14, 1941	Jan. 7, 1941	Dec. 16, 1940	Jan. 16, 1940
<b>Flat Rolled Steel:</b> (Cents Per Lb.)					<b>Pig Iron:</b> (Per Gross Ton)				
Hot rolled sheets .....	2.10	2.10	2.10	2.10	No. 2 fdy., Philadelphia..	\$25.84	\$25.84	\$24.84	\$24.84
Cold rolled sheets .....	3.05	3.05	3.05	3.05	No. 2, Valley furnace....	24.00	24.00	23.00	23.00
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50	No. 2, Southern Cin'ti..	23.06	23.06	23.06	23.06
Hot rolled strip .....	2.10	2.10	2.10	2.10	No. 2, Birmingham ....	19.38	19.38	19.38	19.38
Cold rolled strip .....	2.80	2.80	2.80	2.80	No. 2, foundry, Chicago†	24.00	24.00	23.00	23.00
Plates .....	2.10	2.10	2.10	2.10	Basic, del'd eastern Pa..	25.34	25.34	24.34	24.34
<b>Tin and Terne Plate:</b> (Dollars Per Base Box)					Basic, Valley furnace....	23.50	23.50	22.50	22.50
Tin plate .....	\$5.00	\$5.00	\$5.00	\$5.00	Malleable, Chicago† ....	24.00	24.00	23.00	23.00
Manufacturing ternes ...	4.30	4.30	4.30	4.30	Malleable, Valley .....	24.00	24.00	23.00	23.00
<b>Bars and Shapes:</b> (Cents per Lb.)					L. S. charcoal, Chicago..	30.34	30.34	30.34	30.34
Merchant bars .....	2.15	2.15	2.10	2.15	Ferromanganese† .....	120.00	120.00	120.00	100.00
Cold finished bars .....	2.65	2.65	2.65	2.65	†The switching charge for delivery to foundries in the Chi- cago district is 60c. per ton. ‡For carlots at seaboard.				
Alloy bars .....	2.70	2.70	2.70	2.70	<b>Scrap:</b> (Per Gross Ton)				
Structural shapes .....	2.10	2.10	2.10	2.10	Heavy melt'g steel, P'gh..	\$21.75	\$23.75	\$22.75	\$18.50
<b>Wire and Wire Products:</b> (Cents Per Lb.)					Heavy melt'g steel, Phila.	20.50	21.50	20.75	18.00
Plain wire .....	2.60	2.60	2.60	2.60	Heavy melt'g steel, Ch'go	19.75	20.75	20.50	16.50
Wire nails .....	2.55	2.55	2.55	2.55	Carwheels, Chicago .....	20.75	21.75	21.75	15.75
<b>Rails:</b> (Dollars Per Gross Ton)					Carwheels, Philadelphia..	23.00	23.25	23.25	20.25
Heavy rails .....	\$40.00	\$40.00	\$40.00	\$40.00	No. 1 cast, Pittsburgh...	21.75	22.75	22.75	18.75
Light rails .....	40.00	40.00	40.00	40.00	No. 1 cast, Philadelphia..	23.50	23.75	23.25	20.25
<b>Semi-Finished Steel:</b> (Dollars Per Gross Ton)					No. 1 cast, Ch'go (net ton)	18.75	19.25	19.25	14.25
Rerolling billets .....	\$34.00	\$34.00	\$34.00	\$34.00	<b>Coke, Connellsville:</b> (Per Net Ton at Oven)				
Sheet bars .....	34.00	34.00	34.00	34.00	Furnace coke, prompt...	\$5.50	\$5.50	\$5.50	\$4.00
Slabs .....	34.00	34.00	34.00	34.00	Foundry coke, prompt...	5.75	5.75	5.75	5.50
Forging billets .....	40.00	40.00	40.00	40.00	<b>Non-Ferrous Metals:</b> (Cents per Lb. to Large Buyers)				
<b>Wire Rods and Skelp:</b> (Cents Per Lb.)					Copper, electro., Conn.*..	12.00	12.00	12.00	12.50
Wire rods .....	2.00	2.00	2.00	2.00	Copper, Lake, New York.	12.00	12.00	12.00	12.50
Skelp (grvd) .....	1.90	1.90	1.90	1.90	Tin (Straits), New York.	50.10	50.10	50.05	47.00
					Zinc, East St. Louis ....	7.25	7.25	7.25	5.75
					Lead, St. Louis .....	5.35	5.35	5.35	5.35
					Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 102-108 herein. On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

## Composite Prices

FINISHED STEEL				PIG IRON				SCRAP STEEL			
Jan. 14, 1941.....	2.261c. a Lb.....			\$23.44 a Gross Ton.....				\$20.66 a Gross Ton.....			
One week ago.....	2.261c. a Lb.....			\$23.44 a Gross Ton.....				\$22.00 a Gross Ton.....			
One month ago.....	2.261c. a Lb.....			\$22.61 a Gross Ton.....				\$21.33 a Gross Ton.....			
One year ago.....	2.261c. a Lb.....			\$22.61 a Gross Ton.....				\$17.67 a Gross Ton.....			
<b>High</b>				<b>High</b>				<b>High</b>			
1941.....											
1940.....	2.261c., Jan. 2	2.211c., Apr. 16		\$23.44, Dec. 23	\$22.61, Jan. 2			\$22.00, Jan. 7	\$20.66, Jan. 14		
1939.....	2.286c., Jan. 3	2.236c., May 16		22.61, Sept. 19	20.61, Sept. 12			21.83, Dec. 30	16.04, Apr. 9		
1938.....	2.512c., May 17	2.211c., Oct. 18		23.25, June 21	19.61, July 6			22.50, Oct. 3	14.08, May 16		
1937.....	2.512c., Mar. 9	2.249c., Jan. 4		23.25, Mar. 9	20.25, Feb. 16			15.00, Nov. 22	11.00, June 7		
1936.....	2.249c., Dec. 28	2.016c., Mar. 10		19.74, Nov. 24	18.73, Aug. 11			21.92, Mar. 30	12.92, Nov. 10		
1935.....	2.062c., Oct. 1	2.056c., Jan. 8		18.84, Nov. 5	17.83, May 14			17.75, Dec. 21	12.67, June 9		
1934.....	2.118c., Apr. 24	1.945c., Jan. 2		17.90, May 1	16.90, Jan. 27			13.42, Dec. 10	10.33, Apr. 29		
1933.....	1.953c., Oct. 3	1.792c., May 2		16.90, Dec. 5	13.56, Jan. 3			13.00, Mar. 13	9.50, Sept. 25		
1932.....	1.915c., Sept. 6	1.870c., Mar. 15		14.81, Jan. 5	13.56, Dec. 6			12.25, Aug. 8	6.75, Jan. 3		
1931.....	1.981c., Jan. 13	1.883c., Dec. 29		15.90, Jan. 6	14.79, Dec. 15			8.50, Jan. 12	6.43, July 5		
1930.....	2.192c., Jan. 7	1.962c., Dec. 9		18.21, Jan. 7	15.90, Dec. 16			11.33, Jan. 6	8.50, Dec. 29		
1929.....	2.236c., May 28	2.192c., Oct. 29		18.71, May 14	18.21, Dec. 17			15.00, Feb. 18	11.25, Dec. 9		
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.				Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.				Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.			



# Summary of the Week

ORGANIZATION of a four-man committee on iron and steel priorities, which will serve under E. R. Stettinius, Jr., Director of Priorities, in the new Office of Production Management recently created by President Roosevelt, provides the machinery by which mandatory priorities on iron and steel may be issued whenever the occasion requires. This step does not necessarily bring priorities nearer, however, as the naming of this committee is a part of the OPM setup.

Neither the steel industry and its customers nor Government authorities have been anxious to bring about such a rigid control of iron and steel as a priority system would entail, and thus far the supply of steel has been well handled from the standpoint of those doing defense work as well as those in the larger category of non-defense manufacturing.

IF mandatory priorities should be put into effect in the near future, it will be because of the unrestrained steel buying of the past few weeks. Despite the curbs which steel companies have been trying to place on orders, commercial users are insisting that orders be put on the books for the second and third quarters, and in some instances, for the remainder of the year.

In addition to the rationing system which most steel companies now employ, they have been obliged further to remind customers that all orders and delivery promises are subject to priorities.

While the steel industry has been opposed to priorities on the theory that there will be enough steel to go around if buying is done in an orderly manner, it would undoubtedly welcome priorities as an alternative to excessive building of new plant capacity, which even if authorized now could not possibly be completed in time to be of help in the tight situation that is likely to exist during the first half of this year.

A survey of steel capacity and requirements now being undertaken by Dr. Gano Dunn, results of which will be reported to President Roosevelt, may be the means for bringing about a practical solution of the steel capacity question.

Nearly all steel companies are sold out for the first quarter, virtually the only exceptions being defense requirements, which are given preference over ordinary commercial orders, and the occasional small lots that can conveniently be fitted into a rolling schedule. The bulk of current orders, which in aggregate volume are fully as large as those of November

• Iron and steel priorities committee set up, but adoption of mandatory priorities may not come immediately . . . Steel users appear to be hastening that step, however, by loading mills with tonnage . . . Scrap prices reduced 50c to \$2 a ton.

and December, is for second and third quarter, predominantly the second.

DEFENSE orders are increasing in number and total volume. Shell steel is one item that is becoming more active, but nearly all products are affected in more or less degree. Products most heavily booked are semi-finished steel, plates, shapes, sheet piling, bars, sheets, strip, and electric furnace steel of all types.

The success of the Government's effort to stabilize prices of iron and steel scrap at reasonably low levels is still to go through a more severe test than it has had thus far. Prices of many grades have been reduced from 50c. to \$2 a ton, but the situation is obviously an artificial one in which the law of supply and demand has been set aside by fear of what Washington might do in the event action of the scrap trade does not accomplish the desired result. THE IRON AGE scrap composite price has declined to \$20.66 from \$22 last week. No. 1 heavy melting steel is down \$2 at Pittsburgh and \$1 at Chicago and Philadelphia. While the announced government objective was \$20, Pittsburgh, for this grade, it was apparently not the thought in Washington or in the trade that this could be accomplished immediately. Steel mills have stayed out of the market until the situation settles. Such price reductions as have been made are the result of action by brokers and dealers and in most instances the quotations are nominal in the sense that they have not been thoroughly tested.

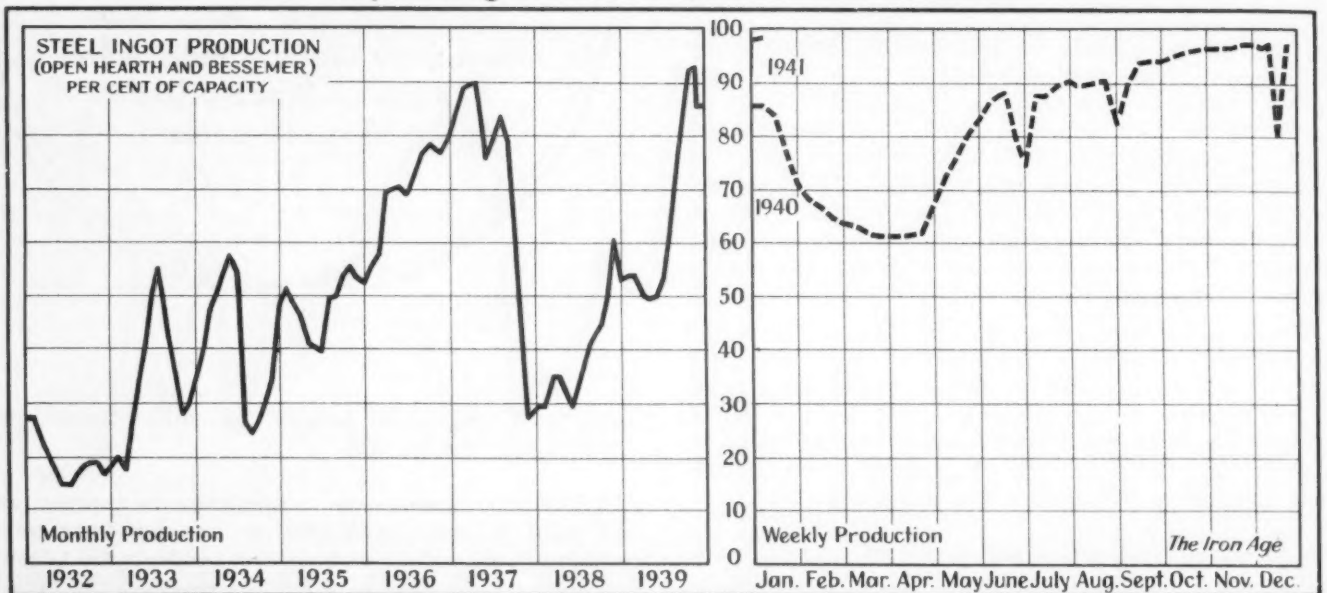
Ingot production, estimated this week by the American Iron and Steel Institute at 98½ per cent, includes electric furnace steel, not hitherto reported either weekly or monthly. THE IRON AGE estimate of 98 per cent is still based on open hearth and Bessemer steel only.

# The Industrial Pace . . .

**A** RENEWAL of activity at pre-holiday levels in those industries represented in THE IRON AGE index of capital goods activity lifted the index in the past week to 128.2, a new high exceeded only in 1929. In the preceding week the index stood at 120.5, a month ago at 126.2, and at 102.8 in the comparable week of 1940. Four of the five components included in the index advanced, the automobile series by 20.3 points, as the result of a jump in assemblies from 76,690 to 115,935. The heavy construction component rose 10.4 points to 172.0 in the week.

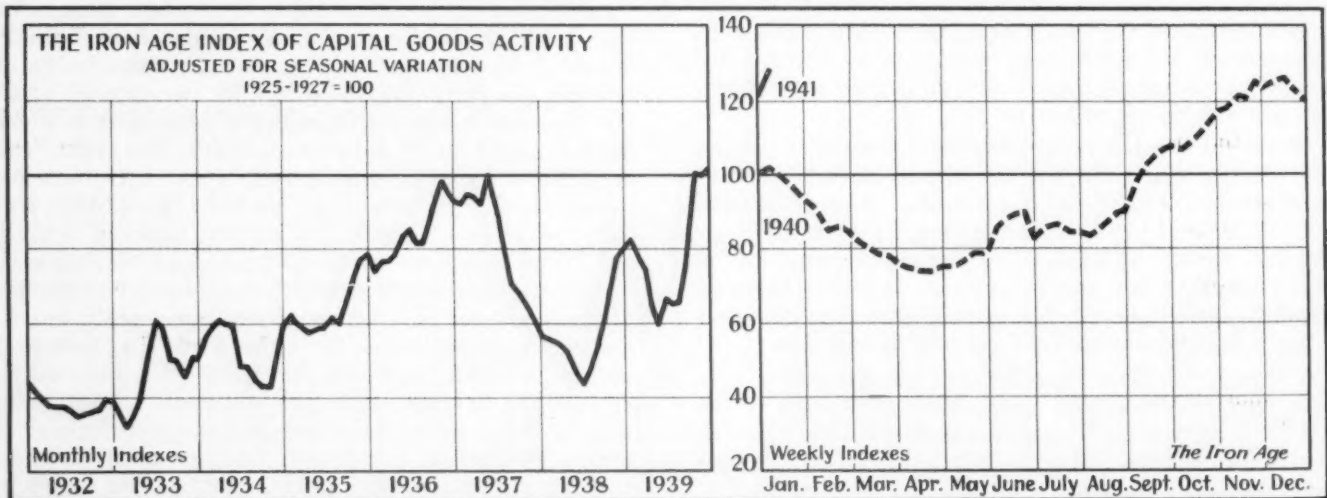
Heavy construction contracts awarded in 1940 reached the highest total on record, \$3,987,243,000, topping the previous high in 1929 by 1 per cent, and exceeding the 1939 total by 33 per cent. Total of public contracts, \$2,824,989,000, set a new high, while private contracts, \$1,162,254,000, were the highest since 1930. Iron and steel exports in November continued to decline, being 16 per cent under the October total, although twice as large as in November, 1939. Trend of steel scrap prices up until Jan. 7 was upward, THE IRON AGE composite price having advanced from \$21.17 to \$22 in five weeks.

## Operating Rate Advances a Half Point



District Ingot Production, Per Cent of Capacity	Pittsburgh	Chicago	Valleys	Philadelphia	Cleveland	Buffalo	Wheeling	Detroit	Southern	S. Ohio	Western	St. Louis	Eastern	Aggregate
Current Week	98.0	98.0	98.0	94.0	91.0	104.5	104.0	100.0	94.0	104.5	82.5	102.5	113.0	98.0
Previous Week	98.0	99.5	98.0	94.0	91.0	104.5	104.0	97.0	94.0	101.0	82.5	102.5	90.5	97.5

## Capital Goods Index Up Sharply to New High



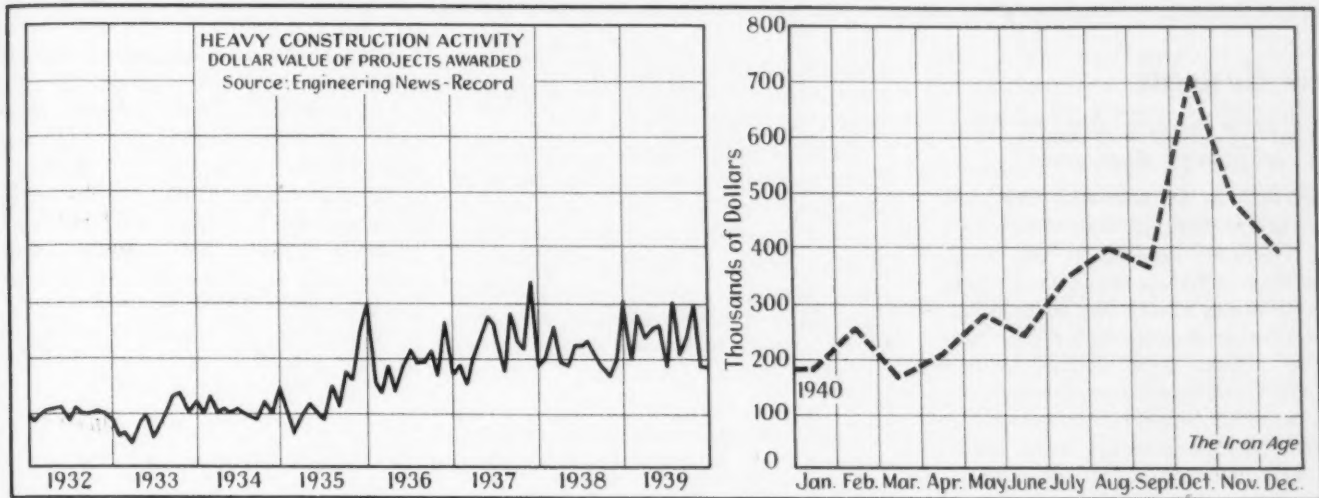
Component	Week Ended	Jan. 11	Jan. 4	Dec. 14	Jan. 13 1940	Jan. 12 1929
Steel ingot production <sup>1</sup>		137.2	138.0*	139.5	123.7	118.3
Automobile production <sup>2</sup>		126.6	106.3	122.5	121.6	149.3
Construction contracts <sup>3</sup>		172.0	161.6	157.0	86.8	112.0
Forest products carloadings <sup>4</sup>		72.8	67.7	85.3	63.8	133.9
Pittsburgh output and shipments <sup>5</sup>		132.6	128.9*	126.5	118.3	120.2
COMBINED INDEX		128.2	120.5*	126.2	102.8	126.7

\* Revised.

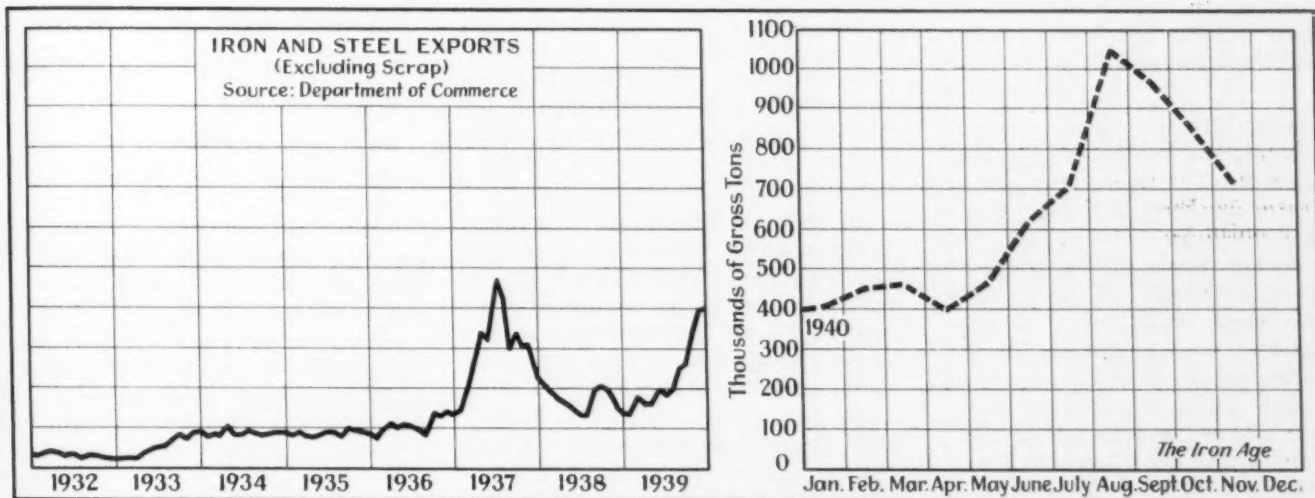
Sources: <sup>1</sup>THE IRON AGE; <sup>2</sup>Wards Automotive Reports; <sup>3</sup>Engineering News-Record; <sup>4</sup>Association of American Railroads; <sup>5</sup>University of Pittsburgh. Indexes of forest products carloadings and activity in Pittsburgh area reflect conditions as of week ended Jan. 4. Other indexes cover week of Jan. 11.



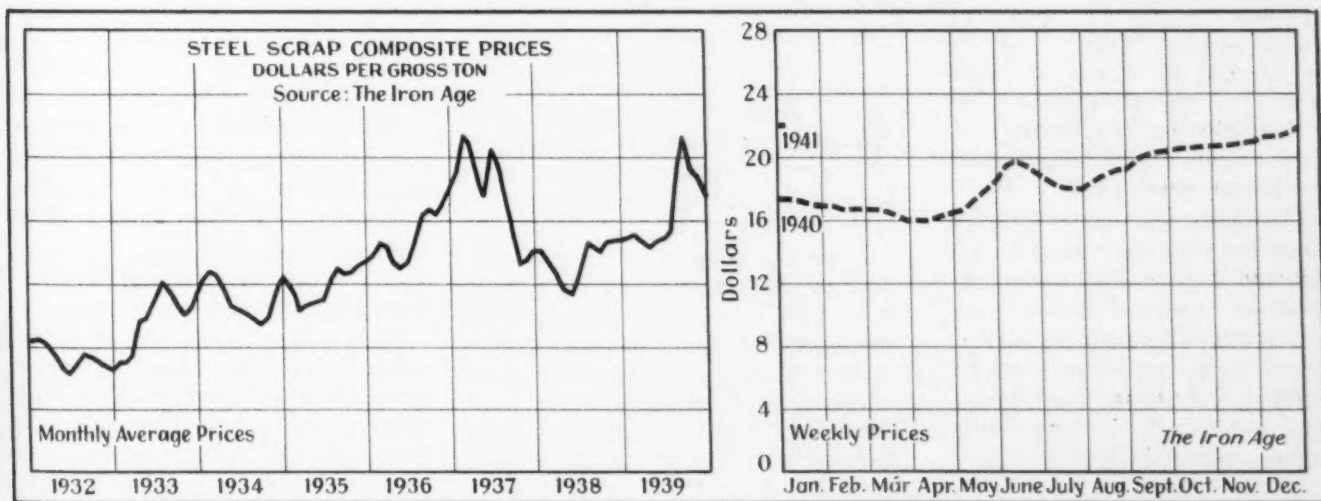
## Building Awards in 1940 Highest in History



## Steel Exports Lower in November



## The Recent Trend of Scrap Prices



# Market Views

...THE WEEK'S ACTIVITIES IN IRON AND STEEL

## New Business

... Heavy buying adds to backlogs, lengthens deliveries

Activity at PITTSBURGH the past week approximated the volume of steel business booked in the week preceding Christmas. Total demand reflects about the same characteristics and, although some companies report less order volume than in the same December period, part of this condition is self-induced. On the average, mill backlogs are running from nine to 11 weeks, although some products cannot be had in that time. The bulk of current bookings remains purely domestic with direct and indirect national defense projects not yet totaling up to major proportions. English buying has been lagging behind tentative setups of a month ago.

Pressure in rails, structurals and bars is getting tighter and tighter at CHICAGO. The steady increase in structural business of the last three months continues. Orders there for the first two weeks of the new year have been ahead of shipments, though some mills report no increase over the comparable period in December. A more panicky tone is noted from non-defense purchasers who are asking for reservations as far ahead as August. Their requests are met with strings attached for some mills refuse to tie up schedules that far in advance. Producers report an increasing number of informal priorities which are being met promptly though some jumbling of schedules has been caused. Because of the heavy demand all items, with the exception of tin plate, are tight with backlogs on the entire line averaging from two to four months with different producers.

Home appliance manufacturers continue their strong calls for steel in CHICAGO, forgers are booked into the second quarter, heavy machinery builders have seven months backlogs, farm implement makers are meeting their expected heavy demand and strictly defense orders are coming out with more and more steel specifications—particularly in

the matter of shells. Warehouses maintain peak activity and are dipping into their stocks.

Even though output of ingots at CLEVELAND is running 10 points ahead of the rate a year ago, while the YOUNGSTOWN district shows a 20-point gain, steel orders at both cities are still in excess of production. This month holds promise of being one of the most active Januarys on record from every standpoint.

Consumers are estimating future requirements very generously, but in most cases the probabilities appear to justify the action. Manufacturers in CLEVELAND and Northern Ohio are swinging into the defense program either through direct awards or subcontracting. At the same time the British are increasingly active, but, due to the fact that more manufacturing for the British is being undertaken in the United States, it is more difficult to identify and analyze British requirements.

In spite of efforts by EASTERN PENNSYLVANIA producers to maintain shipments at maximum levels little headway is being made against heavy backlogs because of the sustained flow of specifications to all mills in the district. Practically all producers are virtually sold up for the remainder of the quarter and increasingly heavy tonnages are being taken for late in the second period. The greatest activity is in plates and sheets, although deliveries of shapes and bars are also running into late April. Automotive purchases of flat rolled products have failed to show their usual seasonal decline and, coupled with miscellaneous buying, have resulted in a strongly sustained demand. One or two sheet buyers with standard specifications have placed orders for delivery in early third quarter.

In the first half of the month bookings at BIRMINGHAM have kept pace with the heavy volume of orders for the corresponding period in December.

The volume of new orders received at BUFFALO mills has increased backlogs to a figure far beyond anything ever experienced

by the local steel industry. Taxed to the limit of their ability in filling specifications from their regular customers, mills are turning orders for considerable tonnage from new buyers. Meanwhile, with first quarter tonnages sold out, deliveries have been extended for every steel product manufactured. Reinforcing bars are not being promised by one mill before mid-April; plates are extended 12 to 13 weeks.

Armaments are not playing a heavy role in the SOUTHERN OHIO steel demand. The trade finds it extremely difficult to trace more than a small amount of business to direct defense requirements.

## Pig Iron

... Producers generally sold out for first quarter

Merchant furnaces in the PITTSBURGH district have booked about all they can ship in the first quarter and steel mills serving the merchant pig iron trade have continued to cut down on the amount of merchant pig iron accepted for delivery.

CHICAGO producers are also virtually sold out for the first quarter. Little has been done there about following the \$1 advance made by a leading producer. Those furnaces with iron available are generally selling at the advanced price, but others apparently are waiting until their supplies are more plentiful before they decide on price.

EASTERN PENNSYLVANIA consumers have covered most of their first quarter needs and current orders consist mainly of carload lots for quick shipment. Shipments are running heavier than in December.

No price advance has yet been announced by any of the producers in the BIRMINGHAM district. Shipments to meet record bookings for the first quarter are being maintained at a high level.

While Northern iron is quotable in SOUTHERN OHIO at \$1 above the last quarter price, no formal announcement has been made. In fact, the only district producer is not accepting new business, since



both of its blast furnaces are on basic for use at the Middletown plant of American Rolling Mill Co.

The Eastern pig iron market becomes clearer as more producers announce their new prices or indicate that they will take business only at the new level. Furnaces are anxious, however, to insure that commitments will not extend beyond March 31. On that date the United Mine workers agreement expires and an effect on coke prices is a possibility.

A leading BUFFALO seller that had allowed regular customers to cover for first quarter at old prices has stepped up prices \$1 on all orders now being placed.

Blast furnace No. 5 at the Ohio works of Carnegie-Illinois Steel Corp. in YOUNGSTOWN was scheduled to resume blast Wednesday, leaving only one idle stack in the YOUNGSTOWN district, and that one is a partly dismantled furnace. One stack of Republic Steel Corp. is expected to go off in the near future, however.

Within the next few days American Steel & Wire Co., Donora, Pa., is expected to blow in its second and last blast furnace.

## Steel Operations

*... Ingot production estimated at 98 per cent*

Commencing this week, the American Iron and Steel Institute has revised its weekly estimate of steel ingot production to include ingots and castings made in electric furnaces, and its monthly reports of ingot production will, it is understood, also include actual output of electric furnaces which has not hitherto been included in such figures. The institute estimated production on the new basis this week at 98½ per cent, but the THE IRON AGE estimate, still covering only open hearth and Bessemer steel, is 98 per cent.

Although steel ingot production in the fourth quarter broke all records, there was 3,000,000 tons of unused steel melting capacity in that period, according to a statement issued by the American Iron and Steel Institute. As this reserve capacity is gradually brought into use, the steel production rate will continue to advance and possibly may go above 100 per cent of practical capacity.

## Iron Ore

*... New shaft being sunk at Ishpeming, Mich.*

Negaunee Mining Co., which is owned jointly by Cleveland-Cliffs and Bethlehem Steel Co. and operated by Cleveland-Cliffs, is sinking a new deep shaft at Ishpeming, Mich., which is expected to be completed in 1944. For the first time since 1930 the M. A. Hanna Co. is reopening the Wabigon mine, an open pit property on the Mesabi Range, and will resume shipments this year.

## Semi-Finished Steel

*... Demand outstrips output  
... Inquiries carefully scanned*

Demand continues to outstrip production at PITTSBURGH. British buying remains under what had been expected, although some improvement in the volume of specifications from that source materialized the past week. Mill bookings would probably be much larger if all business being offered were accepted.

On forging quality as well as other semi-finished steel items, CLEVELAND and YOUNGSTOWN producers are scanning inquiries very closely and in some cases restricting tonnages because of the pressure from their own mills.

## Bolts, Nuts and Rivets

*... Intense activity brings old equipment into use*

At Cleveland during the past month bolt machines idle for as long as ten years have resumed operations, indicating the high degree of activity in the industry. The production load is uneven but producers are attempting to balance it. All consuming fields are inquiring and the armament program is being felt more and more. Automobile companies have been releasing very heavily.

Most mills in CHICAGO are handling a heavy railroad demand for track bolts and fittings. Trackage to be laid at the various Midwestern ordnance units are also furnishing important volume in this item. New business with that district's producers is ahead of the previous month.

## Wire Products

*... Chain fence sales for defense plants gain*

Wire and wire product sales at PITTSBURGH are substantially unchanged from a week ago. Merchant wire business is coming up to expectations, automobile makers remain important buyers of manufacturers wire and rod sales are being restricted to regular customers.

CLEVELAND reports chain fence sales are benefiting greatly from the necessity of enclosing new defense plants, each involving 20 to 30 miles of fence. Inquiries for various types of manufacturers' wire remain strong, particularly in the stainless field. Nail production continues unbalanced, with heavy machines overloaded.

## Structural Steel

*... Fabrication awards total 40,100 tons ... New projects 14,250 tons*

Fabricated structural steel awards advanced to 40,100 tons from 33,900 tons a week ago. The largest lettings include 11,700 tons for a bridge at New London, Conn., over the Thames River, 3000 tons for the Bath-Todd Shipbuilding Co., at Portland, Me., 3000 tons for 1941 bridge requirements for the Rock Island Lines, 2000 tons for a transit shed at Norfolk, Va., 1500 tons at Detroit for blast furnace repairs and new shell for the Great Lakes Steel Corp., 1360 tons for an ammunition building at Kingsbury, Ind., 1250 tons for an assembly and repair shop, engine test building and air conditioning building at Quonset Point, R. I., 1200 tons for air corps hangars for the War Department at various locations, and 1000 tons for the Strietman Bakery, Cincinnati.

New structural steel projects dropped to 14,250 tons from 48,500 tons. Sizable inquiries are 1650 tons for an armor tempering plant for the Midvale Co., Philadelphia, 1600 tons for a supercharger plant at Everett, Mass., for the General Electric Co., and 1000 tons at Cabin Creek, Va., for a power house extension for the Appalachian Electric Power Co.

## Sheets and Strip

*... Deliveries become more extended, backlogs heavier*

Sheet deliveries have become further extended at PITTSBURGH with the major portion of this quarter already filled up. Considering consumer stocks, shipments going forth to customers and the volume of business already on the books, no shortage of sheets is imminent. Successful bidders are expected to be announced soon on approximately 25,000 tons of flat rolled material including hot, cold rolled and pickled sheets to be fabricated into aerial practice bombs. PITTSBURGH reports business from automotive centers at an unchanged rate with direct and indirect defense requirements steadily increasing.

Backlogs of hot and cold rolled sheets are gaining each week at CHICAGO, one mill there reporting that they are second only to carbon and alloy bars. Stove, washing machine, and refrigerator interests still send in heavy specifications—and farm implement producers are active purchasers, too. Culvert sheets have shown an important spurt in the last few weeks which is attributed to the heavy construction program of the defense project.

At CLEVELAND and YOUNGSTOWN aggregate daily orders frequently exceed output, preventing reduction of backlogs.

Southern Ohio sheet producers are loath to accept further demand for this quarter.

## Plates

*... Deliveries getting tighter  
... Second quarter now quoted*

The heavy influx of plate orders over the last several weeks and the promise of even heavier business because of shipbuilding and other defense projects is straining plate capacity on high speed strip mills to the utmost. Incidentally, this condition is also responsible for some of the extended deliveries being promised on sheets.

More light armor plate is being sought at CHICAGO by tank contractors who are swinging into production on these orders. Railroads are seeking considerable plate

## G-E's 1940 Orders Highest On Record

*Schenectady*

• • • Orders received by General Electric Co. during 1940 amounted to \$654,190,000 compared with \$360,748,000 for 1939, an increase of 81 per cent, Charles E. Wilson, president, said. Orders covering equipment for national defense purposes amounted to approximately \$250,000,000, with the result that the total volume of business in 1940 was greater than that for any other year in the company's history. In the final quarter of 1940, orders received reached the all-time record three-months' total of \$256,380,000 compared with \$112,166,000 for the same quarter of 1939, an increase of 129 per cent.

tonnage, one inquiry from a car-builder being for more than 1000 cars of various sizes and types. Deliveries there are getting tighter and considerable "shopping around" is in evidence. Backlogs for most mills more than fill the first quarter.

All EASTERN PENNSYLVANIA mills but one now offer no earlier shipment than the second quarter with much tonnage having been booked for late in that period. A large Eastern road will take about 25,000 tons for completion of a new car building program, announced this week.

## Merchant Bars

*... Deliveries extended by substantial forward buying*

Fresh bar orders about match the incoming rate present before the Christmas holidays. Order books at some makers plants are behind the same period in December but this situation has arisen due to inability to book tonnage at the required delivery rather than lack of demand. Deliveries at PITTSBURGH remain somewhat extended. No small part of the present bar business constitutes substantial forward buying.

CHICAGO steelmakers find their deliveries and backlogs in carbon and alloy bars lengthening. Steel specifications are being issued steadily by shellmakers, several large inquiries

over 10,000 tons each now being in circulation. One mill extended deliveries on carbon bars from nine to 13 weeks up to 10 to 15 weeks, and alloy bars from four to six weeks up to six to eight weeks. Another producer reports all current schedules closed and is quoting deliveries for early May.

At CLEVELAND and YOUNGSTOWN both aggregate tonnage and the numerical volume of orders are described as comparable to the late November and early December volume. Schedules on all bar mills of at least one major producer are full well into April. Shipments for the British are very heavy.

## Tin Plate

*... Cold reduction mills running at 78%*

Moderate improvement continues in new tin plate buying, the increases coming from the general line can trade. Cold reduction mills are estimated to be running at 78 per cent, unchanged from last week.

## Reinforcing Steel

*... Awards only 4900 tons ...  
Inquiries for 7700 tons*

Reinforcing steel awards were 4900 tons. The only letting of size was 2000 tons for a navy pier and transit shed at San Diego, Cal. Among new reinforcing steel projects of 7700 tons are 1700 tons for a hangar at Columbus, Ohio, for the Curtiss-Wright Corp., and 1000 tons for a flood wall at Huntington, W. Va., for the U. S. engineer.

## Tubular Goods

*... Pittsburgh reports slower merchant pipe demand*

Aside from some slowing down in merchant pipe demand, tubular goods market at PITTSBURGH reflects little change from activity present over the past month or two.

Defense plants, housing projects for workers and cantonments continue to yield large amounts of standard pipe, reports CLEVELAND. Several large pipeline projects in South America hold promise of becoming actualities this year.



## Railroad Buying

*... Pennsylvania to build 4500 freight cars and other equipment*

Several large building programs are reported this week by leading railroads.

Pennsylvania announces the building of 4500 freight cars, 200 cabooses, five electric passenger locomotives, 20 locomotive tenders, 600 bulk freight containers and the remodeling of 80 passenger coaches. This program will be carried out in the company's own shops. The 4500 freight cars are estimated to require approximately 80,000 tons of steel.

The Pacific Fruit Express Co. includes in its 1941 improvement program the construction of 1000 refrigerator cars by the Pacific Ore & Foundry Co., Renton, Wash., the rebuilding of 2000 cars and repairing of 1000.

Freight car orders were also placed by Illinois Central with General American Transportation Corp. for 115 70 ton gondolas and by the Seaboard Air Line for 500 50-ton box cars from Pullman Standard Car Mfg. Co. and 200 hopper cars from Bethlehem Steel Co.

Missouri Pacific Railway has been authorized to purchase two streamlined trains powered with 4000 hp. engines.

This week's inquiries include 116 70-ton cars of various types by the Tennessee Coal, Iron & Railroad Co., the inquiry for five to ten 4-6-6-4 type locomotives by the Denver & Rio Grande Western, and the announcement that the Navy Department, Bureau of Supplies and Accounts, will receive bids on Jan. 21 on four Diesel locomotives and spares for Western and Eastern yards.

## \$12 Million Small Arms

*Plant for St. Louis*

*Washington*

••• The War Department has awarded an \$11,819,400 contract on a cost-plus-fixed-fee basis for the construction of a plant for the manufacture of small arms ammunition at St. Louis. The contractors are the Fruin-Colnon Contracting Co., the Fruco Construction Co., St. Louis, and the Massman Construction Co., Kansas City.

## 4 On New Steel Priorities Boards

*Washington*

••• Establishment of a four-man iron and steel priorities committee was announced last week by Edward I. Stettinius, Jr., director of the new division of priorities in the Office of Production Management.

Walter S. Tower, president of the American Iron & Steel Institute, will represent the industry; Carl Conway, board chairman of Continental Can Co., will represent industrial consumers. Other members of the committee include Capt. Paul Hendron, Navy Department representative, and Lt.-Col. Hugh C. Minton, Army representative. The iron and steel priorities committee was the first to be created since the defense machinery was reorganized under the OPM.

A commercial aircraft priorities section, designated early this week by Mr. Stettinius, will be headed by Arthur B. Whiteside, of Dun & Bradstreet, New York, who was a former NRA division administrator. Industry advisory committees also will be set up to supervise priorities in chemicals, tools and equipment, and general products.

Ernest M. Hopkins, president of Dartmouth College, has been named executive officer of the newly-created Minerals and Metals Priority Section under Mr. Stettinius. Mr. Hopkins will act as chairman of all advisory industry committees functioning under the minerals and metals section.

Also named to Mr. Stettinius' staff were James F. Towers, executive vice-president of Ford, Bacon & Davis, Inc., New York industrial engineering firm, who will be assistant director in charge of administration; Blackwell Smith, former legal adviser in the Industrial Materials Division, to be assistant director in charge of staff activities.

Charles E. Adams, president of the Air Reduction Corp., and former consultant to the Industrial

Materials Division, will organize the activities of various industry committees; A. C. C. Hill, Jr., former acting deputy administrator of priorities under the old priorities board, will be deputy director, and Isador Lubin, commissioner of labor statistics, Department of Labor, and consultant to the defense commission's labor division, has been appointed labor consultant to Mr. Stettinius.

Members of the new priorities board include in addition to Mr. Stettinius, John D. Biggers, director, division of production; Donald M. Nelson, director, division of purchases, and Leon Henderson, member of the National Defense Advisory Commission in charge of price stabilization. Ex-officio members of the board are William S. Knudsen, OPM director general, and Sidney Hillman, associate director general.

## Bendix Aviation Corp. Orders Advance 157%

••• Reflecting national defense business, Bendix Aviation Corp. established new records in earnings and sales, the annual report issued recently discloses. The corporation and domestic subsidiaries reported for the nine months ended Sept. 30 earnings more than double and sales 64.54 per cent ahead of the corresponding 1939 period. Backlog of unfilled orders on Sept. 30 increased 157 per cent over that at the beginning of the calendar year.

Net income of Caterpillar Tractor Co. increased to \$7,295,920 for the 11 months ended Nov. 30, equal to \$3.87 a share on 1,882,240 common shares, from \$5,305,573 for the year-earlier period, equal to \$2.51 a common share, after allowing for dividends on the preferred stock retired Nov. 25, 1939. Sales for the eleven months rose to \$66,181,407 from \$54,295,893.

Minneapolis-Moline Power Implement Co. reports for the fiscal year ended Oct. 31, 1940, consolidated net profit of \$1,165,736, equal to \$11.81 a share on 98,700 shares of \$6.50 cumulative preferred stock. After allowing for one year's dividend requirements on the preferred stock, earnings for the 1939-1940 year were equivalent to 74c. a common share.

# Machine Tools

... SALES, INQUIRIES AND MARKET NEWS

## 1941 Output May Reach \$700,000,000

Cleveland

••• At this juncture estimates of probable 1941 output are being boosted above the \$600,000,000 mark previously talked about. Some authorities believe that \$700,000,000 worth of machine tools may be turned out. Shipments are being accelerated very swiftly at present, new plant additions are coming in and some of the new equipment on order is being received by producers.

The leasing of 43,000 sq. ft. by Warner & Swasey Co. will provide additional floor space for the assembly of machines for the British and the development indicates expansion of sub-contracting.

Much additional work is being farmed out by the aircraft industry. A company at Bryan, Ohio, is understood to be tooling up for the production of three-bladed propeller hubs. It is believed that the new tank plant at Lima may begin supplying the British in mid-summer.

Reports from Washington indicate that much emphasis is being placed on horizontal and vertical boring machines, radial drills and planers, jig boring machines and gear equipment. The government has arbitrarily increased by 50 per cent all its orders for such machines in 1941.

## Priorities More Strictly Enforced

New York

••• The new priority setup has considerable teeth in it and in recent weeks there have been a number of cases where shipping schedules have been adjusted to take care of an urgent case. Buyers without priority rating are being given delivery promises into 1942. Only up to a month ago, practically all defense contracts were being given an A-1 priority and as far as most machine tool builders were concerned, it was still a case of first come, first served. All that is gone with the assignment of A-1-A, A-1-B, A-1-C, etc. A low number priority today

means real preference to the extent that others not only must stand aside, but must relinquish their earlier place in line.

Much of the delay in getting into production on defense business can be attributed to engineering and legal delays in Washington. Contracts have yet to be signed with companies that have already bought and installed machine tools for defense projects. On the new Defense Plant Corp. setup, to protect themselves against possible cancellation due to engineering changes some sellers are asking and are receiving up to 25 per cent of cash with order where special tooling is involved.

Buying is much more widespread than it was, as the smaller concerns begin to get subcontract work. The biggest project in the process of closure in the past 10 days is the purchase of \$2,000,000 worth of tools for the E. W. Bliss torpedo plant. British buying is heavy and the indications are that the machinery will be shipped to contractors in this country as has been done in the example of cartridge making machinery. Russian buying is fairly active, whereas the Japanese have dropped out of the market, lacking export licenses.

## 7-Day Work Week Being Tried

Cincinnati

••• The turn of this year has brought serious attention to machinery production. With manufacturers unworried about demand which is generally estimated to be 25 to 50 per cent higher this year than last, methods of delivery are foremost. Some isolated instances of a trial of a seven-day work week were noted the past week, but even those experimenting are not emphatic in assurance of continuance. It is generally felt, however that the longer week is likely to become prevalent. Attention is most strongly focused on plant expansions, with a number under way and others being hurried to definite form.

New business follows the broad

pattern of last year, with some British purchases of older types of small tools on which production is more rapid.

## Studebaker New Plane Engine Plant to Employ 4000

South Bend, Ind.

••• A contract that is expected to top \$100,000,000 for the building of Wright Aeronautical duplex Cyclone engines by the Studebaker Corp., will call for plant construction and expansion totaling \$36,799,300, a sum which may reach \$50,000,000 by the time necessary machinery is purchased. Studebaker will build a completely new plant in Chicago, the site of which will not be disclosed until final contractual details are approved by the Army. The Chicago plant will employ about 4000. Plants will also be constructed in South Bend and Ft. Wayne, Ind. More than four million dollars is to be spent in a training program for the skilled men that will be required.

The engines will be manufactured in Chicago and assembled in South Bend. The engines are of the air-cooled, radial type and will be used in the Douglas B-18 bombers.

## Curtiss-Wright Studies Sites At Pittsburgh

Pittsburgh

••• Several sites for a proposed new Curtiss-Wright plant here are under consideration but none had been decided upon early this week, according to James McKee, manager, Curtiss-Wright propeller plant here. The War Department recently announced an allocation of \$14,000,000 for a Curtiss-Wright Corp. expansion program and it is understood the local plant would consume the major part of this allocation although other facilities are to be expanded in Indianapolis and Caldwell, N. J. Difficulty has been encountered, Mr. McKee said, in obtaining a proper site out of the flood zone with adequate railroad facilities.



# Non-Ferrous Metals

## ... MARKET ACTIVITIES AND PRICE TRENDS

New York, Jan. 14—Most important development in the non-ferrous markets in the past week was the Presidential proclamation placing six metals, including copper and zinc, under the export licensing control system. The order, effective Feb. 3, has been expected for some time and meets general approval in the trade. Regulations affecting export shipments are expected soon. Prices in all major markets continued unchanged in the week and activity, except in the lead and tin markets where it fell off slightly, remained at about the same levels.

Recently issued copper statistics show domestic shipments in December at the all-time record high of 112,671 tons, a small increase in production, and a decrease of 15,646 tons in refined stocks. December shipments compared with 102,483 tons in November, while production was 97,035 tons as compared with 96,283 tons in November. Stocks at the end of December totaled 142,772 tons, as against 158,418 tons at the end of November. Major producers continued to allocate material in the past week on the established basis of 12c. a lb., delivered Valley, while custom smelters did a good business at 12.50c. for the March and April positions. Export activity was moderate at the previous week's level.

### Zinc

In line with expectations, total stocks of slab zinc at the end of December showed a further decline from stocks at the end of the previous month, according to statistics released in the past week. Both production and shipments showed an increase in the month. December stocks, 12,884 tons, was not far above the record low of 11,227 tons set in August, 1937, and compared with 18,386 tons available at the end of November. Shipments of all grades showed a rise in December to 65,385 tons from 62,295 in November. Production was increased in the month by 2424 tons to 59,883 tons from 56,459 tons in November. For

the year 1940 production totaled 643,386 tons, as compared with 538,198 tons in 1939. Shipments for the past year were 696,497 tons, as against 598,972 tons in 1939.

### Lead

Although consumer interest was of a rather spotty nature in the past week, particularly toward the latter part of the period, most sellers reported transactions in volumes at least up to and, in some cases, in excess of intake. Most of the transactions involved February delivery. That month is now about 45 per cent sold while January lacks only about 5 per cent of being accounted for. Lead supplies for the present continue ample and the market is very firm at 5.50c. a lb., delivered New York.

### Tin

The market continued unchanged throughout the past week and the beginning of the present period, with prompt Straits metal quoted at 50.10c. per lb., delivered New York, for the January and February positions while 50.05c. was being asked for delivery subsequent to those months. A fairly good business was done with consumers at these levels in addition to what the Metals Reserve Co. took at the government buying price. Most of the interest centered around the future positions since the nearby requirements of most consumers have already been well covered. Total arrivals since Jan. 1 now approximate something less than 4000 tons.

(Non-ferrous prices on page 103)

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# Scrap

## ... MARKET ACTIVITIES AND QUOTATION TRENDS

Scrap prices have been brought down from 50c. to \$2 a ton on a majority of grades in all markets as a result of the mandatory action of the price stabilization division of the National Defense Advisory Commission. About 600 scrap dealers who attended the annual convention of the Institute of Scrap Iron and Steel at Baltimore last week heard Leon Henderson and W. L. Batt of the defense commission discuss the situation, and went home determined to bring about a reduction of prices through artificial methods.

They have done so, but the prices in many instances are purely nominal, not having been tested by consumer purchases, although there has been some broker-dealer buying. Pittsburgh prices are down \$2 and Chicago and Philadelphia prices \$1. And there have been reductions of like amount in other important districts. THE IRON AGE composite price has declined to \$20.66 from \$22 last week.

One of the complications in the situation is the volume of outstanding orders taken at prices that have been in effect during the past two or three weeks. Whether yard dealers and industrial holders of scrap will sell their holdings at the reduced levels remains to be seen, but in this matter the scrap dealers have been promised the support of government authorities to prevent hoarding and selling by producers at excessive prices.

### Pittsburgh

Most activity here this week has been between brokers and dealers with brokers offering and obtaining some No. 1 heavy melting at \$21.50. A few small consumer sales involving No. 1 steel have been made at \$22 a ton. At least two brokers have made firm offers to sell No. 1 heavy melting scrap to consumers at \$22 a ton. Although most quotations are relatively nominal, enough evidence is present to support a quote of \$21.50 to \$22 a ton for No. 1 heavy melting steel, down \$2 from last week. Whether this quotation sticks depends of course on future developments. If brokers who are selling No. 1 steel to consumers at \$22 a ton cannot cover without extreme diffi-

culty, the entire market will probably again go purely nominal until further clarification is available. At the time of going to press successful bids on railroad lists were unavailable and reports persist that longer than the usual time will be required to obtain this information because of Washington developments. Other scrap grades have been reduced in amounts ranging from 50c. to \$1.50 a ton.

### Philadelphia

In the complete absence of mill buying during the past week prices of most items were marked down 50c. to \$1 on the basis of broker purchases in the period. All prices are nominal. No. 1 steel is quoted at \$20.50, while No. 2 is marked down to \$19.50. Heavy breakable cast is off \$1 and No. 1 cupola is down to \$23.50. Machine shop turnings and blast furnace grades are lower by corresponding amounts. Specific determination of the market awaits consumer action.

An error was made in the prices of machine shop turnings and No. 1 blast furnace scrap in this market in our issue of Jan. 2. The correct quotations for that week were: machine shop turnings, \$15.50 to \$16, No. 1 blast furnace, \$14.50 to \$15.

### Chicago

Following the government's demand that scrap prices move downward, No. 1 heavy melting steel here dropped \$1 a ton to the level of \$19.50 to \$20. Considerable tonnage was purchased by mills at this price during the past week. There is a definite indication of complete cooperation on the part of brokers and dealers with the governmental price program, as practically the entire list shifted to lower bases on the assumption that it should follow the leader. Steel mill items all fell in line, while foundry lists were somewhat mixed, averaging a slightly lesser decline. A definite sympathy is evident in specialties, although prices have not as yet followed the drop in steel scrap. A note of confusion persists within the market as sales at the previous week's level were rumored and as doubt is expressed in some quarters over the fate of contracts based on higher prices.

The Southwestern Freight Bureau deferred action regarding a cut of freight rates for scrap from Gulf ports to St. Louis, Chicago and other Mid-Western points.

### Detroit

Scrap has flowed so freely during the past week that there is every evidence of an unloading on the part of dealers who do not wish to be caught with much tonnage in their yards if prices should go still lower. Actual reductions in the order of \$2 from the real peak of early January prices have been made but Detroit published quotations are lowered approximately \$1, which

is in line with circumstances. (Published quotations did not reach the extreme peak). On one of the most important items, bundles, it is understood that an order for a considerable tonnage at a price equivalent to \$19.50 F.O.B. cars has been placed.

### New York

The local scrap market is in a confused state. While prices have been marked down \$1 to \$1.50 from last week's level and No. 1 is quoted at \$16 to \$16.50, this appraisal is approximate, being based on dealers' buying only. Consumers who are covered for current needs are awaiting further developments.

### Boston

Business has come to a standstill pending price developments. Current quotations are generally \$1.50 a ton lower than a week ago, but in the case of textile and machinery cast all of \$2 lower. However, offers of \$10.40 a ton f.o.b. for steel turnings for eastern Pennsylvania delivery, and of \$10.13 a ton for Pittsburgh district delivery, as well as \$17.75 for No. 1 heavy melting steel for Worcester, Mass., delivery are in the market. These offers are made against old unfilled contracts and average slightly higher than general quotations.

### Cleveland

The market is weaker here and \$21 to \$21.50 for No. 1 heavy melting steel appeared to be the approximate level on Monday. This is a decline of \$2 a ton. Blast furnace grades are off \$1 a ton. Automobile lists were scheduled to close Wednesday, with 130 cars offered at the Cleveland plant alone.

### Buffalo

Government efforts to shake down prices have confused, rather than clarified, the situation here. While dealers have announced reductions of \$1.50 to \$2.50 a ton, with No. 1 heavy melting steel now quoted at \$21 to \$21.50 a ton, the entire price structure admittedly is nominal and with the first mill sale may change overnight.

### St. Louis

The scrap iron market in St. Louis declined from 50c. to \$1.50 a ton.

### Birmingham

Brokers and steel companies here re-entered the scrap market Tuesday with announcement that a \$1 decrease for all items had been established locally.

### Cincinnati

Following the Washington suggestion, district scrap dealers went to work on reducing prices in this area in earnest. Since rises had not been as volatile as in other areas, the shrinkage is more conservative; bids being down \$1 a ton for this week.



# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$21.50 to \$22.00
Railroad heavy mltng.	22.50 to 23.00
No. 2 heavy melting	20.50 to 21.00
Railroad scrap rails	23.00 to 23.50
Rails 2 ft. and under	26.50 to 27.00
Comp. sheet steel	21.50 to 22.00
Hand bundled sheets	20.50 to 21.00
Heavy steel axle turn	20.50 to 21.00
Heavy steel forge turn	19.50 to 20.00
Machine shop turnings	15.50 to 16.00
Short Shov. Turn. Alloy	
Free	16.00 to 16.50
Mixed bor. & turn.	15.50 to 16.00
Cast iron borings	16.00 to 16.50
Cast iron carwheels	22.00 to 22.50
Heavy breakable cast	17.00 to 17.50
No. 1 cupola cast	21.50 to 22.00
RR. knuckles & coup.	26.00 to 26.50
Rail coil springs	26.50 to 27.00
Rail leaf springs	26.50 to 27.00
Roller steel wheels	26.50 to 27.00
Low phos. billet crops	27.00 to 27.50
Low phos. punchings	26.00 to 26.50
Low phos. heavy plate	25.50 to 26.00
Railroad malleable	25.50 to 26.00

## PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$20.50
No. 2 hvy. mltng. steel	19.50
Hydraulic bund., new	20.50
Hydraulic bund., old	17.50
Steel rails for rolling	\$25.00 to 26.00
Cast iron carwheels	23.00
Hvy. breakable cast	22.00
No. 1 cupola cast	23.50
Mixed yard (f'd'y) cast	20.50
Stove plate (steel wks.)	19.00
Railroad malleable	23.50 to 24.00
Machine shop turn.	15.50
No. 1 blast furnace	14.00
Cast borings	16.50
Heavy axle turnings	19.50
No. 1 low phos. hvy.	26.00 to 26.50
Couplers & knuckles	26.00 to 26.50
Roller steel wheels	26.00 to 26.50
Steel axles	25.00 to 25.50
Shafting	26.00
Spec. iron & steel pipe	18.00 to 18.50
Cast borings (chem.)	16.50

## CHICAGO

Delivered to Chicago district consumers:	
Per Gross Ton	
Hvy. mltng. steel	\$19.50 to \$20.00
Auto. hvy. mltng. steel	
alloy free	18.50 to 19.00
No. 2 auto steel	16.25 to 16.75
Shoveling steel	19.50 to 20.00
Factory bundles	19.00 to 19.50
Dealers' bundles	17.50 to 18.00
No. 1 busheling	18.50 to 19.00
No. 2 busheling, old	11.50 to 12.00
Roller carwheels	23.25 to 23.75
Railroad tires, cut	23.00 to 23.50
Railroad leaf springs	23.00 to 23.50
Steel coup. & knuckles	23.00 to 23.50
Axle turnings	18.75 to 19.25
Coil springs	24.00 to 24.50
Axle turn. (elec.)	19.75 to 20.00
Low phos. punchings	23.00 to 23.50
Low phos. plates 12 in. and under	22.50 to 23.00
Cast iron borings	14.00 to 14.50
Short shov. turn.	14.00 to 14.50
Machine shop turn.	14.50 to 15.00
Re-rolling rails	23.00 to 23.50
Steel rails under 3 ft.	23.00 to 23.50
Steel rails under 2 ft.	23.50 to 24.00
Angle bars steel	22.50 to 23.00
Cast iron carwheels	20.50 to 21.00
Railroad malleable	24.25 to 24.75
Agric. malleable	17.50 to 18.00
Per Net Ton	
Iron car axles	\$23.50 to \$24.00
Steel car axles	24.00 to 24.50
Locomotive tires	18.00 to 18.50
Pipes and flues	14.00 to 14.50
No. 1 machinery cast	18.50 to 19.00
Clean auto. blocks	18.00 to 18.50
No. 1 railroad cast	17.50 to 18.00
No. 1 agric. cast	16.50 to 17.00
Stove plate	13.00 to 13.50
Grate bars	14.00 to 14.50
Brake shoes	14.25 to 14.75

## YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$22.00 to \$22.50
No. 2 hvy. mltng. steel	20.50 to 21.00
Low phos. plate	25.00 to 25.50
No. 1 busheling	21.00 to 21.50
Hydraulic bundles	21.50 to 22.00
Machine shop turn	15.00 to 15.50

## CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$21.00 to \$21.50
No. 2 hvy. mltng. steel	20.00 to 20.50

Comp. sheet steel	\$20.50 to \$21.00
Light bund. stampings	17.00 to 17.50
Drop forge flashings	19.50 to 20.00
Machine shop turn	14.00 to 14.50
Short shov. turn	14.50 to 15.00
No. 1 busheling	20.25 to 20.75
Steel axle turnings	20.50 to 21.00
Low phos. billet and bloom crops	25.00 to 25.50
Cast iron borings	14.50 to 15.00
Mixed bor. & turn	14.50 to 15.00
No. 2 busheling	14.50 to 15.00
No. 1 Machinery cast	23.00 to 23.50
Railroad cast	22.00 to 22.50
Railroad grate bars	16.00 to 16.50
Stove plate	16.00 to 16.50
Rails under 3 ft.	25.50 to 26.00
Rails for rolling	25.00 to 25.50
Railroad malleable	24.00 to 24.50

## BUFFALO

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$21.00 to \$21.50
No. 2 hvy. mltng. steel	19.00 to 19.50
Scrap rails	21.50 to 22.00
New hvy. b'ndled sheets	18.50 to 19.00
Old hydraulic bundles	17.00 to 17.50
Drop forge flashings	18.50 to 19.00
No. 1 busheling	18.50 to 19.00
Machine shop turn	13.50 to 14.00
Shov. turnings	14.50 to 15.00
Mixed bor. & turn	13.50 to 14.00
Cast iron borings	13.50 to 14.00
Knuckles & couplers	25.00 to 25.50
Coil & leaf springs	25.00 to 25.50
Roller steel wheels	25.00 to 25.50
No. 1 machinery cast	20.50 to 21.00
No. 1 cupola cast	19.00 to 19.50
Stove plate	16.50 to 17.00
Steel rails under 3 ft.	25.50 to 26.00
Cast iron carwheels	18.50 to 19.00
Railroad malleable	23.50 to 24.00
Low phos. plate	26.50 to 27.00

## ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:	
Selected hvy. melting	\$18.50 to \$19.00
No. 1 hvy. melting	18.00 to 18.50
No. 2 hvy. melting	17.00 to 17.50
No. 1 locomotive tires	21.00 to 21.50
Misc. stand. sec. rails	21.50 to 22.00
Railroad springs	23.50 to 24.00
Bundled sheets	14.00 to 14.50
Cast bor. & turn	11.00 to 11.50
Machine shop turn	12.00 to 12.50
Heavy turnings	14.50 to 15.00
Rails for re-rolling	23.00 to 23.50
Steel car axles	26.00 to 26.50
No. 1 RR. wrought	16.00 to 16.50
No. 2 RR. wrought	17.00 to 17.50
Steel rails under 3 ft.	23.00 to 23.50
Steel angle bars	21.50 to 22.00
Cast iron carwheels	22.00 to 22.50
No. 1 machinery cast	20.00 to 20.50
Railroad malleable	21.50 to 22.00
Breakable cast	18.00 to 18.50
Stove plate	15.00 to 15.50
Grate bars	14.50 to 15.00
Brake shoes	15.00 to 15.50

## CINCINNATI

Dealers' buying prices per gross ton at yards:	
No. 1 hvy. mltng. steel	\$18.75 to \$19.25
No. 2 hvy. mltng. steel	16.75 to 17.25
Scrap rails for mltng.	23.75 to 24.25
Loose sheet clippings	13.25 to 13.75
Hyd'lic bundled sheets	17.50 to 18.00
Cast iron borings	9.75 to 10.25
Machine shop turn	10.50 to 11.00
No. 1 busheling	14.75 to 15.25
No. 2 busheling	8.25 to 8.75
Rails for rolling	25.00 to 25.50
No. 1 locomotive tires	20.75 to 21.25
Short rails	26.25 to 26.75
Cast iron carwheels	19.25 to 19.75
No. 1 machinery cast	22.25 to 22.75
No. 1 railroad cast	20.50 to 21.00
Burnt cast	13.25 to 13.75
Stove plate	13.25 to 13.75
Agricul. malleable	18.00 to 18.50
Railroad malleable	21.00 to 21.50
Mixed hvy. cast	19.25 to 19.75

## BIRMINGHAM

Per gross ton delivered to consumer:	
No. 1 hvy. melting steel	\$18.00
No. 2 hvy. melting steel	17.00
No. 1 busheling	16.00
Scrap steel rails	18.00
Steel rails under 3 ft.	20.00
Rails for rolling	19.00
Long turnings	8.50
Cast iron borings	7.50
Stove plate	11.50
Steel axles	18.00
No. 1 RR. wrought	16.00
No. 1 cast	18.00
No. 2 cast	13.00
Cast iron carwheels	19.00
Steel carwheels	18.00

## DETROIT

Dealers' buying prices per gross ton, f.o.b. cars:	
No. 1 heavy melting	\$17.00 to \$17.50
No. 2 heavy melting	16.00 to 16.50
Borings and turnings	12.00 to 12.50
Machine shop turnings	11.50 to 12.00
Long turnings	10.00 to 10.50
Short shov. turnings	12.50 to 13.00
No. 1 cast	19.50 to 20.00
Automotive cast	19.50 to 20.00
Hvy. breakable cast	16.00 to 16.50
Stove plate	12.00 to 12.50
Hydraulic comp. sheets	19.00 to 19.50
New busheling	17.00 to 17.50
Sheet clips	14.50 to 15.00
Flashings	17.00 to 17.50
Low phos. plate	19.50 to 20.00

## NEW YORK

Dealers' buying prices per gross ton on cars:	
No. 1 hvy. mltng. steel	\$16.00 to \$16.50
No. 2 hvy. mltng. steel	15.00 to 15.50
Hvy. breakable cast	18.00 to 18.50
No. 1 machinery cast	18.50 to 19.00
No. 2 cast	16.50 to 17.00
Stove plate	15.00 to 15.50
Steel car axles	23.00 to 24.00
Shafting	19.50 to 20.50
No. 1 RR. wrought	17.50 to 18.00
No. 1 wrought long	17.00 to 17.50
Spec. iron & steel pipe	12.00 to 12.50
Rails for rolling	19.00 to 19.50
Clean steel turnings*	11.00 to 11.50
Cast borings*	11.00 to 11.50
No. 1 blast furnace	9.00 to 10.00
Cast borings (chem.)	11.00 to 11.50
Unprepared yard scrap	9.50 to 10.00
Light iron	6.50 to 7.00
Per gross ton delivered local foundries:	
No. 1 machin. cast	\$20.50 to \$21.00
No. 2 cast	17.00 to 17.50

\* \$1.50 less for truck loads.

## BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:	
Breakable cast	\$15.25 to \$15.50
Machine shop turn	9.75 to 10.00
Mixed bor. & turn	8.00 to 9.00
Bun. skeleton long	13.25 to 13.50
Shafting	18.25 to 18.50
Stove plate	13.00 to 13.25
Cast bor. chemical	9.50 to 10.00
Per gross ton delivered consumers' yards:	
Textile cast	\$19.00 to \$20.00
No. 1 machine cast	19.00 to 20.00
Per gross ton delivered dealers' yards:	
No. 1 hvy. mltng. steel	\$12.50
No. 2 steel	11.75

## PACIFIC COAST

Per net ton delivered to consumer:	
	San Fran.      Los Ang.      Seattle
No. 1 hvy. mltng. steel	\$14.25      \$13.25      \$15.00
No. 2 hvy. mltng. steel	12.00
Bundles	10.00

## CANADA

Dealers' buying prices at these yards, per gross ton:	
	Toronto      Montreal
Low phos. steel	\$13.00      \$12.50
No. 1 hvy. mltng. steel	11.25      10.75
No. 2 hvy. mltng. steel	10.00      9.75
Mixed dealers steel	8.75      8.25
Drop forge flashings	9.75      9.25
New loose clippings	8.75      8.25
Busheling	6.00      5.50
Scrap pipe	7.75      7.25
Steel turnings	7.50      7.00
Cast borings	7.50      7.00
Machinery cast	20.50      19.50
Dealers' cast	19.50      18.50
Stove plate	16.00      15.50

## EXPORT

Dealers' buying prices per gross ton:	
New York, truck lots, delivered barges	
No. 1 hvy. mltng. steel	\$16.00 to \$17.00
No. 2 hvy. mltng. steel	15.00 to 16.00
No. 2 cast	17.00 to 17.50
Stove plate	15.00 to 16.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel	\$16.00
No. 2 hvy. mltng. steel	14.50
Rail (scrap)	16.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel	Nominal
No. 2 hvy. mltng. steel	Nominal

# Construction Steel

...STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

## Fabricated Steel

Structural steel awards advanced to 40,100 tons from 33,900 tons last week; new projects dropped to 14,250 tons from 48,500 tons.

### AWARDS

#### NORTH ATLANTIC STATES

- 11700 Tons, New London, Conn., Thames River bridge, to Harris Structural Steel Co., Plainfield, N. J.
- 3000 Tons, Portland, Me., buildings for Bath-Todd Shipbuilding Co., to American Bridge Co., Pittsburgh.
- 1250 Tons, Quonset Point, R. I., assembly and repair shop, engine test building and air conditioning building, to Ingalls Iron Works Co., Pittsburgh plant, through George Fuller and Merritt Chapman Scott Corp.
- 1200 Tons, War Department, Air Corps hangars at various locations, to American Bridge Co., Pittsburgh.
- 800 Tons, New York, reconstruction track stringers, Manhattan Bridge, to American Bridge Co., Pittsburgh.
- 500 Tons, New London, Conn., marine railway cradle for Government, to American Bridge Co., Pittsburgh.
- 500 Tons, Philadelphia, storage yard crane runway for Cramp Shipbuilding Corp., to Bethlehem Steel Co., Bethlehem, Pa.
- 450 Tons, New York and Brooklyn, curb angles for Procurement Division, Treasury Department, to Phoenix Bridge Co., Phoenixville, Pa.
- 417 Tons, Cheektowaga, N. Y., boiler house for Curtiss-Wright Corp., to Bethlehem Steel Co., Lackawanna, N. Y., through John W. Cowper Construction Co., Buffalo.
- 410 Tons, Belleville, N. J., building No. 1, plant No. 2 for Walter Kidde & Co., Inc., to Bethlehem Steel Co., Bethlehem, Pa.
- 300 Tons, Harrison, N. J., industrial building, to Bethlehem Fabricators, Inc., Bethlehem, Pa.
- 300 Tons, Corry, Pa., building for Aero Supply & Mfg. Co., to Rogers Structural Steel Co., Corry, Pa.
- 300 Tons, Middletown, Pa., hangar for War Department, to American Bridge Co.
- 250 Tons, Batavia, N. Y., addition for Doehler Die Co., to F. L. Heughes Co., Rochester, through Gleason Corp., general contractor, Rochester.
- 200 Tons, Philadelphia, repairs to shipbuilding ways for Cramp Shipbuilding Corp., to Belmont Iron Works, Philadelphia.
- 200 Tons, Annapolis, Md., addition to Bancroft Hall, U. S. Naval Academy, to Ingalls Iron Works Co., Birmingham.
- 185 Tons, East Hartford, Conn., Main Street bridge, to American Bridge Co., Pittsburgh.
- 185 Tons, Mellville, R. I., Navy Department store house, to Bethlehem Fabricators, Inc., Bethlehem, Pa.
- 170 Tons, New York, cover, New York, Central Railroad, 96th-97th Streets, to Bethlehem Steel Co., Bethlehem, Pa.

- 165 Tons, Falmouth, Mass., ordnance shop at Camp Edwards, to Belmont Iron Works, Philadelphia.
- 120 Tons, Bayside, Long Island, telephone building addition, to Schacht Steel Construction Co., New York.
- 100 Tons, Camden, N. J., pipe welding shop for New York Shipbuilding Corp., to Morris-Wheeler & Co., Philadelphia.

#### THE SOUTH

- 2000 Tons, Norfolk, Va., transit shed, to Bethlehem Steel Co., Bethlehem, Pa.
- 500 Tons, Robbinsville, N. C., 81 transmission towers for Nantahela Power & Light Co., to American Bridge Co., Pittsburgh.
- 475 Tons, Key West, Fla., marine railway cradle for U. S. Govt., to American Bridge Co., Pittsburgh.
- 140 Tons, Benwood, W. Va., skelp mill for Wheeling Steel Corp., to Riverside Steel Co., Wheeling, W. Va.
- 102 Tons, Bogalusa, La., extension to digester room for Gaylord Container Corp., to Ingalls Iron Works Co., Birmingham.

#### CENTRAL STATES

- 3000 Tons, 1941 bridge requirements for Rock Island Lines, to American Bridge Co., Pittsburgh.
- 1500 Tons, Detroit, repairs and new shell for blast furnace for Great Lakes Steel Corp., to Lackawanna Steel Construction Corp., Buffalo.
- 1360 Tons, Kingsbury, Ind., ammunition buildings, to Mississippi Valley Structural Steel Co., St. Louis.
- 1000 Tons, Cincinnati, building for Streitman Bakery, to Indiana Bridge Co., Muncie, Ind.
- 575 Tons, Cuyahoga County, Ohio, state bridge, to American Bridge Co., Pittsburgh.
- 500 Tons, Toledo, Ohio, Toledo Scale Co. expansion, to R. C. Mahon Co., Detroit, through A. Bentley & Sons, Inc.
- 480 Tons, Park Ridge, Ill., Cook County bridge, to American Bridge Co., Pittsburgh.
- 475 Tons, Struthers, Ohio, extension to Sharon Steel Corp. plant, to American Bridge Co., Pittsburgh.
- 430 Tons, Wayne County, Mo., state highway bridge, to Illinois Steel Bridge Co., Jacksonville, Ill.
- 417 Tons, St. Louis, boiler house for Curtiss-Wright Corp., to Stupp Bros. Bridge & Iron Co., St. Louis.
- 417 Tons, Columbus, Ohio, boiler house for Curtiss-Wright Corp., to American Bridge Co., Pittsburgh.
- 415 Tons, Lawrenceburg, Ind., State bridge, contract No. 2092, to Bethlehem Steel Co., Bethlehem, Pa.
- 375 Tons, Cincinnati, Chesapeake & Ohio bridge, to American Bridge Co., Pittsburgh.
- 375 Tons, Trumbull County, Ohio, State bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 350 Tons, Canton, Ohio, pickling building for Timken Roller Bearing Co., to American Bridge Co., Pittsburgh.
- 300 Tons, Conneaut, Ohio, building for General Electric Co., to Erie Concrete & Steel Supply Co., Erie, Pa.

- 260 Tons, Marion, Ind., State bridge, contract No. 2094, to Bethlehem Steel Co., Bethlehem, Pa.
- 250 Tons, Kingsbury, Ind., ceiling beams for ammunition buildings, to Bethlehem Steel Co., Bethlehem, Pa.
- 185 Tons, Portage County, Ohio, State bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 180 Tons, Youngstown, Ohio, airport hangar, to Sause Structural Steel Co., Youngstown.
- 140 Tons, Winnetka, Ill., Tower Road grade separation, to American Bridge Co., Pittsburgh.
- 119 Tons, Williams County, Ohio, State bridge, to American Bridge Co., Pittsburgh.

#### WESTERN STATES

- 800 Tons, Berkeley, Cal., Berkeley High School auditorium, to Bethlehem Steel Co., San Francisco.
- 200 Tons, Vallejo, Cal., hotel addition, to Golden Gate Iron Works, San Francisco.
- Unstated tonnage, Oakland, Cal., two traveling jib cranes for Navy Supply Depot (Specification 10,174), to Dravo Corp., Pittsburgh.

### PENDING STRUCTURAL PROJECTS

#### NORTH ATLANTIC STATES

- 1650 Tons, Philadelphia, No. 2 armor tempering plant for Midvale Co.
- 1600 Tons, Everett, Mass., supercharger plant No. 2 for General Electric Co.
- 700 Tons, New York, apartment house for Arthur Diamond.
- 500 Tons, Thurman Station, N. Y., State bridge RC-41-1.
- 440 Tons, Belleville, N. J., manufacturing building for Defense Plant Corp.
- 350 Tons, Norwood, Mass., storage building for Winslow Brothers & Smith Co.
- 315 Tons, Depew, N. Y., State highway bridge PSC-6582.
- 250 Tons, College Point, N. Y., manufacturing building for I. B. Kleinert Rubber Co.
- 232 Tons, Bradford County, Pa., highway bridge, route 212; bids Jan. 24.
- 225 Tons, Pittsfield, Mass., office and laboratory building for General Electric Co.
- 210 Tons, Canajoharie, N. Y., factory building for Beech-Nut Facking Co.
- 175 Tons, Port Chester, N. Y., storage building extension for Russell-Burdsall & Ward Bolt & Nut Co.
- 160 Tons, Scranton, Pa., highway bridge.
- 150 Tons, Lawrence, Mass., F. W. Woolworth Co. store.
- 142 Tons, Indiana County, Pa., highway bridge, route 320-18; bids Jan. 24.
- 126 Tons, Warren County, Pa., highway bridge, route 89; bids Jan. 24.
- 102 Tons, Bedford County, Pa., highway bridge route 356; bids Jan. 24.

#### THE SOUTH

- 1000 Tons, Cabin Creek, W. Va., power house extension for Appalachian Electric Power Co.
- 300 Tons, State of Oklahoma, four highway bridges; bids Feb. 11.

#### CENTRAL STATES

- 800 Tons, Cleveland, building for Thompson Products, Inc.

## Weekly Bookings of Construction Steel

Week Ended	Jan. 14, 1941	Jan. 7, 1941	Dec. 16, 1940	Jan. 16, 1940	Year to Date	
					1941	1940
Fabricated structural steel awards	40,100	33,900	35,450	13,625	74,000	24,250
Fabricated plate awards	0	1,500	255	120	1,500	540
Steel sheet piling awards	105	1,655	0	250	1,760	250
Reinforcing bar awards	4,900	14,045	6,110	1,365	18,945	11,065
Total Letting of Construction Steel	45,105	51,100	41,815	15,360	92,205	36,105



- 800 Tons, Cleveland, Cleveland Pneumatic Tool Co. building.  
 600 Tons, Ravenna, Ohio, inert storage buildings, type 9, for Government.  
 400 Tons, Columbus, Ohio, Columbus Mutual Life Insurance Co. building.  
 300 Tons, Elyria, Ohio, building for Ridge Tool Co.  
 150 Tons, Mapleton, Minn., State bridge No. 5959.  
 130 Tons, Edgerton, Ohio, State bridge W1-6-35.  
 110 Tons, Lawrenceburg, Ind., still building addition for Jos. E. Seagram & Sons.  
 100 Tons, Bellevue, Ohio, building for General Electric Co.

#### WESTERN STATES

- 525 Tons, Estes Park, Colo., tunnel supports, Continental Divide Tunnel (Specification 950); bids Feb. 3.  
 514 Tons, Denver, two underpasses and two bridges on State highways 2 and 3 (FAP-285B); bids Jan. 23.  
 500 Tons, Richmond, Cal., shipyard for Todd-California Shipbuilding Corp.  
 300 Tons, Keyport, Wash., industrial buildings, Navy Torpedo Station (Specification 10,140); S. S. Mullen, Seattle, low bidder.  
 200 Tons, Sacramento, Cal., buildings at McClellan Field (Invitation CQM 6870-41-10, 11, and 12); bids in.  
 156 Tons, Bakersfield, Cal., Kern River bridges; bids Feb. 5.

#### FABRICATED PLATES

#### PENDING PROJECTS

- 110 Tons, Cleveland, pipe for city; bids Jan. 17.

#### SHEET PILING

#### AWARDS

- 105 Tons, Butler County, Pa., H-piling for route 73, section R-F, to Carnegie-Illinois Steel Corp., Pittsburgh.

#### PENDING PROJECTS

- 500 Tons, Bremerton, Wash., cut-off wall, drydock No. 5, Navy Yard.

## Reinforcing Steel

Awards of 4900 tons; 7800 tons in new projects.

#### AWARDS

#### ATLANTIC STATES

- 235 Tons, Allegheny County, Pa., route 187, sections 6-C and D, to Fort Pitt Bridge Co., Pittsburgh; Ralph Meyers, Salem, Ind., contractor.  
 175 Tons, New York, grade crossing for Long Island Railroad, contract No. 6, to Truscon Steel Co., Youngstown, through Poirer & McLane Corp.  
 100 Tons, York, Pa., Medusa Cement plant, to Truscon Steel Co., Youngstown, through McDonald Engineering Co.

#### SOUTH AND CENTRAL

- 270 Tons, Peoria, Ill., St. Francis Hospital addition, to Bethlehem Steel Co., Bethlehem, Pa.; V. Jobst & Son, contractors.  
 172 Tons, Cleveland, Sears-Roebuck warehouse, to Republic Structural Iron Works, Cleveland.  
 171 Tons, Clark and Green Counties, Ohio, mesh for State project No. 326, to Pittsburgh Steel Co., Pittsburgh.  
 166 Tons, Lake County, Ohio, mesh for State highway project No. 323, to Truscon Steel Co., Youngstown, through Hollinger & Davidson.  
 150 Tons, Cabin Creek, W. Va., project for Appalachian Electric Power Co., to Truscon Steel Co., Youngstown.  
 147 Tons, Muskingum County, Ohio, mesh for State project No. 333, to Pittsburgh Steel Co., Pittsburgh.

#### WESTERN STATES

- 2000 Tons, San Diego, Cal., Navy pier and transit shed, divided between Trojan Steel, Inc., Los Angeles, and Ceco Steel Products Co., Los Angeles, through Mojave Corp., Los Nietos, Cal., and Person & Hollingsworth, Los Angeles, contractors.  
 500 Tons, San Diego, Cal., Consolidated Aircraft factory, to Truscon Steel Co., Youngstown, through J. Harvey Chambers.

#### PUERTO RICO

- 174 Tons, Puerto Rico, U. S. Engineer invitation 1097-41-120, to Bethlehem Steel Co., Bethlehem, Pa.

#### HAWAII

- 531 Tons, Schofield Barracks; 271 tons for gun battalion barracks No. 2, and 260 tons for quartermaster barracks, to Bethlehem Steel Co., San Francisco, through Robert E. McKee, Los Angeles, contractor.  
 108 Tons, Hickam Field, engine test building and spray pool (Invitation QM-6812-41-25), to Columbia Steel Co., San Francisco, through Robert E. McKee, Los Angeles, contractor.

#### PENDING REINFORCING BAR PROJECTS

#### ATLANTIC STATES

- 750 Tons, Everett, Mass., General Electric Co. super-charger building.  
 297 Tons, Brooklyn, Prospect Avenue grade separation, contract B-10; bids taken Jan. 14.  
 250 Tons, Baltimore, Maryland Dry Dock Co. pier; Empire Construction Co., contractor.  
 185 Tons, Boston, Gulf Oil Corp. station.  
 100 Tons, Erie County, N. Y., grade elimination PSCC No. 6582.

#### SOUTH AND CENTRAL

- 1700 Tons, Columbus, Ohio, hangar for Curtiss-Wright Corp.; bids in.  
 1000 Tons, Huntington, W. Va., flood wall, U. S. Engineer.  
 460 Tons, Chicago, substructure, State Street bridge.  
 296 Tons, Denver, two underpasses and two bridges on State highways 2 and 3 (FAP-285B); bids Jan. 23.  
 200 Tons, Wilmington, Ill., igloos, Kankakee Ordnance.  
 150 Tons, St. Louis, store building, Sears-Roebuck & Co.  
 100 Tons, Wright Field, Ohio, aircraft laboratory and shop building; bids Jan. 16.  
 100 Tons, Milwaukee, Naval armory.

#### WESTERN STATES

- 1500 Tons, Mare Island Navy Yard, Cal., quay wall and piers; Henry J. Kaiser, Oakland, Cal., contractor.  
 429 Tons, Los Angeles, Los Angeles County Specification 6818; bids in.  
 146 Tons, Bakersfield, Cal., Kern River bridges; bids Feb. 5.  
 105 Tons, Sacramento, Cal., buildings at McClellan Field (Invitations CQM-6870-41-10, 11, and 12); bids in.

## Cast Iron Pipe

Matthews, N. C., plans pipe lines for water system and other waterworks installation. Fund of \$82,974 has been secured through Federal aid for this and sewage system.

Melcher, Iowa, plans pipe lines for water system and other waterworks installation. Cost about \$70,000. Financing is being arranged through Federal aid.

General Purchasing Officer, Panama Canal, Washington, closes bids Jan. 21 for cement-lined cast iron water pipe and fittings (Schedule 4708).

Marshfield, Wis., asks bids until Jan. 31 for 3000 ft. of 6-in. pipe for water system. Water and Light Commission, Wayne E. Deming, president, in charge.

Langford Waterworks, Inc., Grand Prairie, Tex., plans extensions in water pipe lines, including new lines for supply to industrial plants. Cost about \$35,000. C. E. Langford is president.

Russellville Water District, Portland, Ore., has let contract to Soule & Walters, Elma, Wash., for pipe line system for domestic water distribution in district, at \$40,000. Installation will include about 25,000 ft. of 4 to 8-in. pipe, with valves, fittings, service connections, etc.

Bishop, Cal., plans pipe line extensions in water system and other waterworks installation. Cost about \$75,000. Koebig & Koebig, Rowan Building, Los Angeles, are consulting engineers.

Crandon, Wis., is completing plans for pipe lines for water system and other waterworks installation. Federal grant of \$84,427 has been arranged. Jerry Donohue Engineering Co., 608 North Eighth Street, Sheboygan, Wis., is consulting engineer.

Rushsylvania, Ohio, plans pipe line water system and other waterworks installation. Work is scheduled to begin early next month. Fund of \$217,000 has been arranged through

Federal aid for this and sewage system, including treatment plant. Edison Ellis, Van Wert, Ohio, is consulting engineer.

Water Bureau, Nashville, Tenn., plans pipe line extensions in water system for service at municipal airport and new aircraft plant in that district. Cost about \$200,000 including water reservoir and other facilities. Bond issue of \$125,000 has been authorized, remainder of fund to be secured through Federal grant.

Los Angeles Water and Power Commission has awarded 3719 tons of 6, 8, and 12-in. pipe as follows: 1456 tons to United States Pipe & Foundry Co., San Francisco, 1195 tons to American Cast Iron Pipe Co., Los Angeles, 847 tons to National Cast Iron Pipe Co., Los Angeles, and 221 tons to Pacific States Cast Iron Pipe Co., Provo, Utah.

United States Treasury Department, San Francisco, has awarded 255 tons of 6-in. pipe to American Cast Iron Pipe Co., San Francisco, for delivery at Oakland, Cal.

East Bay Municipal Utility District, Oakland, Cal., has awarded 850 tons of 2, 4, 6 and 8-in. pipe for Pleasant Hill Distribution System (Proposal 257) to United States Pipe & Foundry Co., San Francisco.

Burbank, Cal., has awarded 265 tons of 8 and 10-in. pipe (class 250) to National Cast Iron Pipe Co., Los Angeles.

Bishop, Cal., has taken bids for water system improvements involving 6550 ft. of 12-in. class 150 pipe and 6943 ft. of 12-in. class 100 pipe; also small quantities of 4, 6, 8 and 14-in. cast iron pipe, alternate on 12,843 ft. of 12-in. steel pipe.

## Pipe Lines

Manufacturers' Gas Co., Union Trust Building, Pittsburgh, plans extensions in pressure pipe lines in Warren, McKean, Jefferson and Elk Counties, Pa., for natural gas transmission, in connection with drilling of additional gas wells in that area for increased supply for main distribution centers. Cost over \$150,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 21 for 15,200 ft. of galvanized seamless or welded steel pipe for Eastern and Western Navy yards (Schedule 4920).

Southern Natural Gas Co., Watts Building, Birmingham, plans extensions and improvements in welded steel pipe lines for natural gas transmission and distribution, including new lines and increased capacity of certain existing lines in system. Expansion will be carried out in transmission lines in Logansport natural gas field, DeSota Parish, La., where new well has been drilled. Company is arranging early sale of additional shares of common stock, to total about \$4,800,000, of which over \$2,000,000 will be made available for purpose noted, including gas well development.

Pure Oil Co., 118 West Sixth Street, Tulsa, Okla., has let contract to B. & M. Construction Corp., Petroleum Building, Oklahoma City, for new 6-in. welded steel pipe line from point near Cumberland, Okla., to Durant, Okla., about 16 miles, where connection will be made with pumping station of Texas-Empire Pipe Line Co. Cost over \$100,000. Main offices are at 35 East Wacker Drive, Chicago.

Uvalde, Tex., plans extensions and improvements in municipal pressure pipe line system for natural gas distribution, recently acquired for city-owned operation.

Southern California Gas Co., 810 South Flower Street, Los Angeles, has let contract to Signal Pipe Line Construction Co., 2375 California Avenue, Long Beach, Cal., for new 12-in. steel pipe line in Arroyo Seco, from point near Loreto Street to Avenue 37, for gas transmission.

Producers' Gas Co., Olean, N. Y., plans pressure pipe lines in connection with development of new gas wells in Genesee Township, Allegheny County, N. Y., including pipe line gathering system.

# Prices of Finished Iron and Steel...

Steel prices on these pages are f.o.b. basing points (in cents per lb.) unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point ↓ Product													DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Phila- delphia
<b>SHEETS</b>															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled <sup>1</sup>	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	
Long ternes <sup>2</sup>	3.80¢		3.80¢									4.55¢			
Wrought iron	4.75¢														
<b>STRIP</b>															
Hot rolled <sup>3</sup>	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢		
Cold rolled <sup>4</sup>	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.90¢		
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢								
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢		
<b>TIN PLATE</b>															
Standard cokes (Per 100-lb. base box)	\$5.00	\$5.00	\$5.00						\$5.10						
<b>BLACK PLATE</b>															
29 gage <sup>5</sup>	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (10)			
<b>TERNES, M'FG.</b>															
Special coated (Per base box)	\$4.30		\$4.30						\$4.40						
<b>BARS</b>															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			(Duluth = 2.25¢)		2.50¢	2.80¢	2.25¢	2.40¢	2.47¢
Rail steel <sup>6</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢		
Reinforcing (rail) <sup>7</sup>	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢				2.40¢	2.45¢	2.15¢		
Cold finished <sup>8</sup>	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢							2.70¢		
<b>PLATES</b>										(Coatesville and Claymont = 2.10¢)					
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			2.45¢	2.65¢		2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	
Alloy	3.50¢	3.50¢				(Coatesville = 3.50¢)									
<b>SHAPES</b>															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			(Bethlehem = 2.10¢)		2.45¢	2.75¢		2.27¢	2.215¢
<b>SPRING STEEL C-R</b>															
0.26 to 0.50 Carbon	2.80¢			2.80¢					(Worcester = 3.00¢)						
0.51 to 0.75 Carbon	4.30¢			4.30¢					(Worcester = 4.50¢)						
0.76 to 1.00 Carbon	6.15¢			6.15¢					(Worcester = 6.35¢)						
1.01 to 1.25 Carbon	8.35¢			8.35¢					(Worcester = 8.55¢)						
<b>WIRE<sup>9</sup></b>															
Bright	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)						
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)						
Spring	3.20¢	3.20¢		3.20¢					(Worcester = 3.30¢)						
<b>PILING</b>															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			
<b>IRON BARS</b>															
Common		2.25¢				(Terre Haute, Ind. = 2.15¢)									
Refined	3.75¢														
Wrought	4.40¢														

<sup>1</sup> Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. <sup>2</sup> Unassorted 8-lb. coating. <sup>3</sup> Widths up to 12 in. <sup>4</sup> Carbon 0.25 per cent and less. <sup>5</sup> Applies to 29 gage within certain width and length limitations. <sup>6</sup> For merchant trade. <sup>7</sup> Straight lengths as quoted by distributors. <sup>8</sup> Also shafting. For quantities of 20,000 to 39,999 lb. <sup>9</sup> Carload lots to manufacturing trade. <sup>10</sup> Boxed.



## PRICES

### SEMI-FINISHED STEEL

#### Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher f.o.b. Duluth, billets only, \$2 higher.

*Per Gross Ton*  
Rerolling .....\$34.00  
Forging quality ..... 40.00

#### Shell Steel

Basic open hearth shell steel f.o.b. Pittsburgh and Chicago.

*Per Gross Ton*  
3 in. to 12 in. ....\$52.00  
12 in. to 18 in. .... 54.00  
18 in. and over. .... 56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity. This type of steel is for hot rolled sections used for the forging of shells and includes rounds, round squares, and special sections.

#### Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

*Per Gross Ton*  
Open hearth or bessemer .....\$34.00  
Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

*Per Lb.*  
Grooved, universal and sheared. 1.90c.

#### Wire Rods

(No. 5 to 9/32 in.) *Per Lb.*  
Pittsburgh, Chicago, Cleveland. 2.00c.  
Worcester, Mass. .... 2.10c.  
Birmingham ..... 2.00c.  
San Francisco ..... 2.50c.  
Galveston ..... 2.25c.  
9/32 in. to 4/64 in., \$3 a net ton higher. Quantity extras apply.

### ROOFING TERNE PLATE

(F.o.b. Pittsburgh; Package, 112 Sheets)  
20x14 in. 20x28 in.  
8-lb. coating I.C... \$6.00 \$12.00  
15-lb. coating I.C... 7.00 14.00  
20-lb. coating I.C... 7.50 15.00  
25-lb. coating I.C... 8.00 16.00  
30-lb. coating I.C... 8.63 17.25  
40-lb. coating I.C... 9.75 19.50

### WIRE PRODUCTS

(To the Trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

*Base per Keg*  
Standard wire nails .....\$2.55  
Coated nails ..... 2.55  
Cut nails, carloads ..... 3.85  
*Base per 100 Lb.*  
Annealed fence wire .....\$3.05  
*Base Column*  
Woven wire fence\* ..... 67  
Fence posts (carloads) ..... 69  
Single loop bale ties ..... 56  
Galvanized barbed wire† ..... 70  
Twisted barbed wire ..... 70

\*15 1/2 gage and heavier. †On 80-rod spools in carload quantities.  
Note: Birmingham base same on above items, except spring wire.

### BOLTS, NUTS, RIVETS, SET SCREWS

#### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

*Per Cent Off List*  
Machine and carriage bolts:  
1/2 in. and smaller by 6 in. and shorter .....68  
9/16 and 5/8 in. by 6 in. and shorter .....66  
3/4 to 1 in. by 6 in. and shorter.64  
1 1/8 in. and larger, all lengths..62  
All diameters over 6 in. long..62  
Lag, all sizes .....65

Plow bolts .....68 1/2  
Hot pressed nuts; c.p.c., t-nuts; square, hex., blank or tapped:  
1/2 in. and smaller .....66  
9/16 to 1 in. inclusive .....63  
1 1/8 in. to 1 1/2 inclusive .....61  
1 5/8 in. and larger .....60

On above items, excepting plow bolts, additional allowance of 10 per cent for full container quantities.

On all of the above items there is an additional 5 per cent allowance for carload shipments.

Semi-fin. hexagon nuts U.S.S. S.A.E.  
1/2 in. and smaller ..... 66 70  
9/16 to 1 in. .... 63 65  
1 1/8 in. through 1 1/2 in.. 61 62  
1 5/8 in. and larger ..... 60 ..

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose 73 and 10

Stove bolts in packages, with nuts attached .....73

Stove bolts in bulk .....81

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York, lots of 200 lb. or over.

#### Large Rivets

(1/2 in. and larger)

*Base per 100 Lb.*  
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....\$3.40

#### Small Rivets

(7/16 in. and smaller)

*Per Cent Off List*  
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....65 and 10

#### Cap and Set Screws

*Per Cent Off List*

Milled hexagon head, cap screws, 1 in. dia. and smaller ..... 50  
Milled headless set screws, cut thread 1/4 in. and larger ..... 64  
3/16 in. and smaller ..... 73  
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller ..... 68  
Upset set screws, cup and oval points ..... 74  
Milled studs ..... 52

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

## NON-FERROUS PRICES

*Cents per lb. for early delivery*

	Jan. 8	Jan. 9	Jan. 10	Jan. 11	Jan. 13	Jan. 14
Copper, Electrolytic <sup>1</sup> ....	12.00	12.00	12.00	12.00	12.00	12.00
Copper, Lake ..... 12.00	12.00	12.00	12.00	12.00	12.00	12.00
Tin, Straits, New York.. 50.10	50.10	50.10	50.10	50.10	50.10	50.10
Zinc, East St. Louis <sup>2</sup> .... 7.25	7.25	7.25	7.25	7.25	7.25	7.25
Lead, St. Louis <sup>3</sup> ..... 5.35	5.35	5.35	5.35	5.35	5.35	5.35

<sup>1</sup> Mine producers' quotations only, delivered Conn. Valley. Deduct 1/4c. for approximate New York delivery price. <sup>2</sup> Add 0.39c. for New York delivery. <sup>3</sup> Add 0.15c. for New York delivery.

### Warehouse Products

*Cents per lb., Delivered*

	New York	Cleveland
Tin		
Straits pig ..... 51.25	53.75	
Copper		
Electro ..... 12.75	13.50	
Castings ..... 12.50	13.00	
H. R. Sheets* ..... 20.12	20.12	
Seamless tubes* .... 20.62	20.62	
Brass		
Yellow sheets* ..... 18.65	18.65	
Yellow, rods* ..... 13.67	13.67	
Seamless tubes* .... 21.40	21.40	
Zinc		
Slabs ..... Nom'al	Nom'al	
Sheet, No. 9 casks.. 13.50	Nom'al	
Lead		
American pig ..... 6.50	6.00	
Bar ..... 8.45	8.50	
Cut sheets ..... 8.80	8.75	
Antimony		
Asiatic ..... 16.00	17.00	
Aluminum		
Virgin, 99% ..... 20.00	21.00	
No. 1 remelt., 98-99% 18.00	18.50	
Solder		
1/2 and 1/2 ..... 30.750	32.00	
Babbitt		
Anti-friction grade .. 23.50	21.50	

### Old Metals

*Cents per lb., New York*

*Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their use.*

	Dealers' Buying Prices	Dealers' Selling Prices
Copper		
Hvy. crucible ..... 10.00	10.625	
Hvy. and wire ..... 9.00	9.40	
Light and bottoms.. 8.00	8.50	
Brass		
Heavy ..... 5.750	6.255	
Light ..... 4.750	5.50	
No. 1 yel. turn. .... 5.50	6.50	
No. 1 red or compo. turnings ..... 8.75	9.25	
Hvy. Mach. compo.. 9.00	9.375	
Lead		
Heavy ..... 4.50	5.00	
Aluminum		
Cast ..... 11.00	12.00	
Sheet ..... 14.00	15.00	
Zinc ..... 5.50	5.75	

### Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cents plus, 17c.-18c. a lb.; No. 12 remelt No. 2, standard, 17-17.50c. a lb. NICKEL electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt: Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. QUICK-SILVER, \$162-\$165 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 13.25c. a lb.

\*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras; on copper sheets, 33 1/4; on brass sheets and rods, 40; on brass tubes, 33 1/4, and copper tubes, 40.

## PRICES

### ALLOY STEEL

#### Alloy Steel Blooms, Billets and Slabs

Base per gross ton, f.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem.....\$54.00

#### Alloy Steel Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade ..... 2.70c.  
Delivered, Detroit ..... 2.80c.

S.A.E. Alloy Differential, per 100 Lb.  
Series Numbers  
2000 (1.5 Ni) .....\$0.35

2100 (1.5 Ni) .....	0.75
2300 (3.5 Ni) .....	1.70
2500 (5 Ni) .....	2.55
3100 Ni-Cr .....	0.70
3200 Ni-Cr .....	1.35
3300 Ni-Cr .....	3.80
3400 Ni-Cr .....	3.20
4100 Cr-Mo (0.15 to 0.25 Mo.)..	0.55
4100 Cr-Mo (0.25 to 0.40 Mo.)..	0.75
x4340 Cr-Ni-Mo .....	1.70
4340 Cr-Ni-Mo .....	1.85
4600 Ni-Mo (0.2-0.3 Mo, 1.5-2 Ni)	1.20
5100 (0.60-0.90 Cr) .....	0.35
5100 (0.80-1.10 Cr) .....	0.45
5100 Cr spring steel .....	0.15
52-100 Cr. (electric furnace)...	2.60
6100 Cr-V bar .....	1.20

6100 Cr-V spring steel .....	0.85
C-V .....	0.85

The above differentials are for hot rolled finished products. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

#### Alloy Cold-Finished Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. Delivered Detroit, 3.45c., carlots.

#### Alloy Steel Plates

Base per lb., f.o.b. Pittsburgh, Chicago and Coatesville.  
Open hearth grade ..... 3.50c.

### STAINLESS AND HEAT-RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

#### Chromium-Nickel

No.	304	302
Forging billets .....	21.25c.	20.40c.
Bars .....	25.00c.	24.00c.
Plates .....	29.00c.	27.00c.
Structural shapes .....	25.00c.	24.00c.
Sheets .....	36.00c.	34.00c.
Hot rolled strip .....	23.50c.	21.50c.
Cold rolled strip .....	30.00c.	28.00c.
Drawn wire .....	25.00c.	24.00c.

#### Straight-Chromium

No.	410	430	442	446
Bars .....	18.50c.	19.00c.	22.50c.	27.50c.
Plates .....	21.50c.	22.00c.	25.50c.	30.50c.
Sheets .....	26.50c.	29.00c.	32.50c.	36.50c.
H'tstrip .....	17.00c.	17.50c.	24.00c.	35.00c.
C'ld st. .....	22.00c.	22.50c.	32.00c.	52.00c.

### TOOL STEEL

(F.o.b. Pittsburgh)

	Base per Lb.
High speed .....	67c.
High-carbon-chromium .....	43c.
Oil-hardening .....	24c.
Special .....	22c.
Extra .....	18c.
Regular .....	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

### ELECTRICAL SHEETS

(F.o.b. Pittsburgh)

	Base per Lb.
Field grade .....	3.20c.
Armature .....	3.55c.
Electrical .....	4.05c.
Motor .....	4.95c.
Dynamo .....	5.65c.
Transformer 72 .....	6.15c.
Transformer 65 .....	7.15c.
Transformer 58 .....	7.65c.
Transformer 52 .....	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

### CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago..	\$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham..	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle .....	56.00

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago.

# STRENGTH

## Plus Durability

### Acid Resisting Super B & M METAL PICKLING CHAINS

The High Quality of these electric weld chains with or without forged hooks—made from Hot Rolled Super B & M metal is—  
*Real Economy.*

Write Today—Let Us Answer Your Chain Needs

## WHEELING BRONZE CASTING CO.



ALUMINUM  
HOME OF BRONZE ALLOYS  
Nickel Aluminum Bronze  
Iron Aluminum Bronze  
Plain Aluminum Bronze

WHEELING, W. VA.



## PRICES

### BOILER TUBES

Seamless Steel and Lap Weld Commercial  
Boiler Tubes and Locomotive Tubes.  
Minimum Wall

(Net base prices per 100 ft., f.o.b. Pitts-  
burgh, in carload lots)

	Seamless Cold Drawn	Hot Rolled	Lap Weld, Hot Rolled
1 in. o.d. 13 B.W.G.	\$9.01	\$7.82	....
1 1/4 in. o.d. 13 B.W.G.	10.67	9.26	....
1 1/2 in. o.d. 13 B.W.G.	11.70	10.23	\$9.72
1 3/4 in. o.d. 13 B.W.G.	13.42	11.64	11.06
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2 1/4 in. o.d. 13 B.W.G.	16.76	14.54	13.79
2 1/2 in. o.d. 12 B.W.G.	18.45	16.01	15.16
2 1/2 in. o.d. 12 B.W.G.	20.21	17.54	16.58
2 3/4 in. o.d. 12 B.W.G.	21.42	18.59	17.54
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3 1/2 in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66
4 1/2 in. o.d. 10 B.W.G.	43.04	37.35	35.22
5 in. o.d. 9 B.W.G.	54.01	46.87	44.25
6 in. o.d. 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

### STEEL AND WROUGHT IRON PIPE AND TUBING

#### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District  
and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought iron  
pipe)

Base Price = \$200 Per Net Ton

#### Butt Weld

Steel	Black	Galv.
1/8 in. ....	56	36
1/4 to 3/8 in. ....	59	43 1/2
1/2 in. ....	63 1/2	54
3/4 in. ....	66 1/2	58
1 to 3 in. ....	68 1/2	60 1/2

#### Wrought Iron

	Black	Galv.
1/4 and 3/8 in. ....	+9	+10
1/2 in. ....	24	6 1/2
3/4 in. ....	30	13
1 and 1 1/4 in. ....	34	19
1 1/2 in. ....	38	21 1/2
2 in. ....	37 1/2	21

#### Lap Weld

Steel	Black	Galv.
2 in. ....	61	52 1/2
2 1/2 and 3 in. ....	64	55 1/2
3 1/2 to 6 in. ....	66	57 1/2
7 and 8 in. ....	65	55 1/2
9 and 10 in. ....	64 1/2	55
11 and 12 in. ....	63 1/2	54

#### Wrought Iron

	Black	Galv.
2 in. ....	30 1/2	15
2 1/2 to 3 1/2 in. ....	31 1/2	17 1/2
4 in. ....	33 1/2	21
4 1/2 to 8 in. ....	32 1/2	20
9 to 12 in. ....	28 1/2	15

#### Butt weld, extra strong, plain ends

Steel	Black	Galv.
1/8 in. ....	54 1/2	41 1/2
1/4 to 3/8 in. ....	56 1/2	45 1/2
1/2 in. ....	61 1/2	53 1/2
3/4 in. ....	65 1/2	57 1/2
1 to 3 in. ....	67	60

#### Wrought Iron

	Black	Galv.
1/4 and 3/8 in. ....	+10	+43
1/2 in. ....	25	9
3/4 in. ....	31	15
1 to 2 in. ....	38	22 1/2

#### Lap weld, extra strong, plain ends

Steel	Black	Galv.
2 in. ....	59	51 1/2
2 1/2 and 3 in. ....	63	55 1/2
3 1/2 to 6 in. ....	66 1/2	59

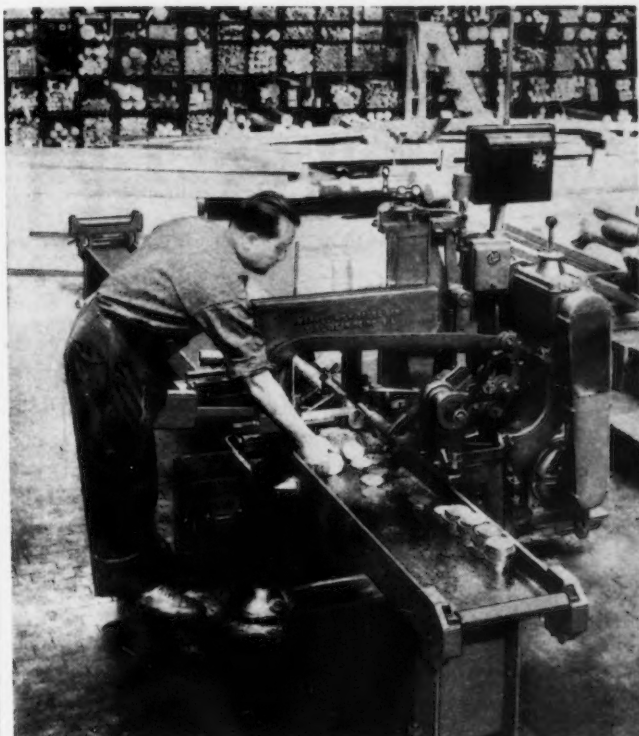
	Black	Galv.
7 and 8 in. ....	65 1/2	56
9 and 10 in. ....	64 1/2	55
11 and 12 in. ....	63 1/2	54

#### Wrought Iron

	Black	Galv.
2 in. ....	33 1/2	18 1/2
2 1/2 to 4 in. ....	39	25 1/2
4 1/2 to 6 in. ....	37 1/2	24
7 and 8 in. ....	38 1/2	24 1/2
9 to 12 in. ....	32	20 1/2

On butt weld and lap weld steel pipe  
jobbers are granted a discount of 5%. On  
less-than-carload shipments prices are de-  
termined by adding 25 and 30% and the  
carload freight rate to the base card.

F.o.b. Gary prices are two points lower  
discount or \$4 a ton higher than Pitts-  
burgh or Lorain on lap weld and one  
point lower discount, or \$2 a ton higher,  
on all butt weld 8 in. and smaller.

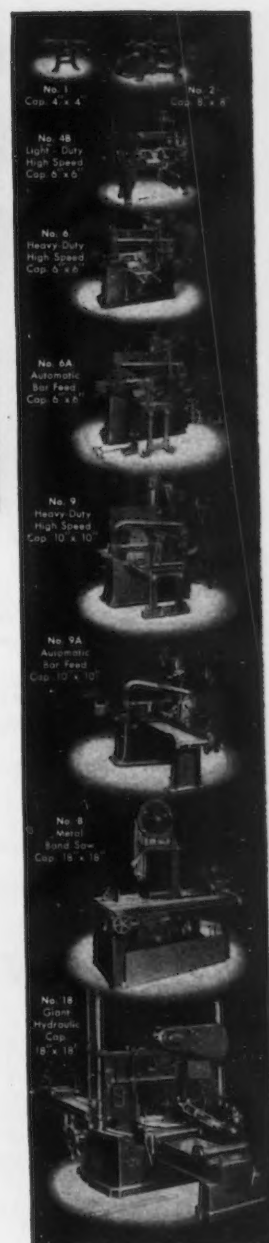


### Pieces come cut-to-length from the Pratt & Whitney Stock Room . . .

There's no double handling of stock cut from bars at the Pratt & Whitney plant; no intermediate operations, no equipment tied up with slow cutting-off methods. Pieces, no matter how many, come from the stock room in slices or lengths ready for machining, because cutting-off has been made a stockroom operation by the new heavy duty, high speed MARVEL No. 9A Automatic Hack Saw with automatic bar push-up. Full length bars lift directly from storage racks to the bar push-up. With a few simple adjustments and the push of a starter button, pieces begin piling up at almost unbelievable speed, accurately cut off from large or nested bars. While the stock keeper attends to his many other duties, this large capacity, all-ball-bearing sawing machine AUTOMATICALLY feeds, AUTOMATICALLY measures and AUTOMATICALLY cuts-off identical pieces, stopping AUTOMATICALLY at any predetermined point.

Moreover, by simply disengaging the belt on the bar feed, a "production" run can be stopped at any point, a miscellaneous cut made, and automatic "production" work resumed by reengaging the bar push-up. MARVEL Production Saws, No. 6A and 9A, are today's fastest, most economical means for accurate cutting-off.

ARMSTRONG-BLUM MFG. CO.,  
"The Hack Saw People,"  
5700 Bloomingdale Ave., Chicago, U.S.A.  
Eastern Sales Office: 199 Lafayette St., New York



## PRICES

### ORES

#### Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, bessemer, 51.50%..	\$4.75
Old range, non-bessemer, 51.50%	4.60
Mesaba, bessemer, 51.50%.....	4.60
Mesaba, non-bessemer, 51.50%..	4.45
High phosphorus, 51.50%.....	4.35

#### Foreign Ores\*

C.i.f. Philadelphia or Baltimore, Exclusive or Duty

Per Unit

Algerian, low P, Cu free, dry, 55 to 58% Fe .....	Nom.
---------------------------------------------------	------

Caucasian, washed, 52% Mn.... Nom.  
African, Indian, 44 to 48% Mn.... 50c.  
African, Indian, 49 to 51% Mn.... 54c.  
Brazilian, 46 to 48% Mn..... 50c.  
Cuban, del'd, duty free, 51% Mn.. 68c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered ....	\$23 to \$24
Tungsten, domestic scheelite, delivered .....	\$23.00
Chrome ore, lump c.i.f. Atlantic Seaboard, per gross ton: South African (low grade) .....	Nom.
Rhodesian, 45% .....	\$23.50
Rhodesian, 48% .....	27.50

### RAILS, TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., gross ton .....	\$40.00
Angle bars, 100 lb.....	2.70

F.o.b. Basing Points

Light rails (from billets), gross ton .....	\$40.00
Light rails (from rail steel), gross ton .....	39.00

Base per Lb.

Cut spikes .....	3.00c.
Screw spikes .....	4.55c.
Tie plates, steel .....	2.15c.
Tie plates, Pacific Coast .....	2.30c.
Track bolts, steam railroads...	4.15c.
Track bolts, discount to jobbers all sizes (per 100 counts)...	65-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapqua, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

### FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail....	\$20.00 to \$21.00
Domestic, f.o.b. Ohio River landing barges .....	20.00 to 21.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines..	20.00 to 21.00
Foreign, 85% calcium fluoride, not over 5% Si., c.i.f. Atlantic ports, duty paid.....	Nominal
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines....	31.00
As above, in bags, f.o.b. same mines .....	32.60

### REFRACTORIES

#### Fire Clay Brick

Per 1000 f.o.b. Works

Super-duty brick at St. Louis..	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois .....	47.50
First quality, New Jersey....	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois .....	42.75
Second quality, New Jersey....	49.00
No. 1 Ohio .....	39.90
Ground fire clay, per ton.....	7.10

#### Silica Brick

Pennsylvania .....	\$47.50
Chicago District .....	55.10
Birmingham .....	47.50
Silica cement, net ton (Eastern)	8.55

#### Chrome Brick

Net per Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester...	\$50.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. ....	50.00

#### Magnesite Brick

Standard f.o.b. Baltimore and Chester .....	\$72.00
Chemically Bonded, f.o.b. Baltimore .....	61.00

#### Grain Magnesite

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks).....	(—)*
Domestic, f.o.b. Baltimore and Chester in sacks .....	\$40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk) .....	22.00

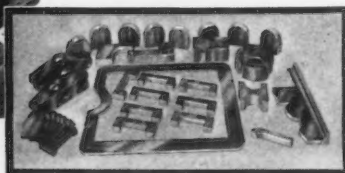
\*None available.



## DoAll STEPS UP PRODUCTION

At the Ingersoll Milling Machine Company, Rockford, Ill., discs for bearing retainers are made from 3140 flat steel on a DoAll in 30 minutes each. Outside diameter is 12", inside 9". A DoAll automatic circle cutting attachment is used.

Other special parts made on the DoAll by Ingersoll include a target gauge in 15 minutes, 2 rocker arms in 12 minutes, head stops in 1 hour each.



## INDISPENSABLE IN DEFENSE WORK

The DoAll is the rugged machine tool that effects such sensational savings in time, labor and material. Takes the place of lathe work, milling and shaping in thousands of plants. Now used in 30 countries for cutting every kind of metal in automobile factories, arsenals, ship yards, aeroplane plants, machine shops, etc.

### SPEEDMASTER



An important part of every DoAll Machine. Gives instant variable speed.

A compact unit, also sold separately for use on any other machines requiring variable speed. Produces any speed, 6 to 1 ratio, by mere touch of handle.

Let us send a factory trained man to your plant to show you what a DoAll can do and save for you.

**FREE** —Handbook on Contour Machining, 158 pages of valuable metal working helps.

### CONTINENTAL BAND FILER

Does continuous filing, which means faster, better, smoother filing on all materials from toughest high-carbon steel to soft brass, wood, etc. Available are 12 styles of file bands, ½", ¾" and 1¼" wide—flat, oval or half round. Ask for circular.

**CONTINENTAL MACHINES, INC.**  
1311 S. Washington Ave. Minneapolis, Minn.



## PRICES

### FERROALLOYS

#### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

*Per Gross Ton*

Domestic, 80% (carload).....\$120.00

#### Spiegeleisen

*Per Gross Ton Furnace*

Domestic, 19 to 21%.....\$36.00

Domestic, 26 to 28%..... 49.50

#### Electric Ferrosilicon

*Per Gross Ton, Delivered, Lump Size*

50% (carload lots, bulk).....\$74.50\*

50% (ton lots, packed)..... 87.00\*

75% (carload lots, bulk).....135.00\*

75% (ton lots, packed).....151.00\*

#### Bessemer Ferrosilicon

*Per Gross Ton, F.o.b. Jackson, Ohio*

10.00 to 10.50%.....\$34.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2% \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

#### Silvery Iron

*Per Gross Ton, F.o.b. Jackson, Ohio*

5.00 to 5.50%.....\$28.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

#### Ferrochrome

*Per Lb. Contained Cr., Delivered Carlots Lump Size, on Contract*

4 to 6% carbon.....11.00c.

2% carbon .....17.50c.

1% carbon .....18.50c.

0.10% carbon .....20.50c.

0.06% carbon .....21.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

#### Silico-Manganese

*Per Gross Ton, Delivered, Lump Size, Bulk, on Contract*

3% carbon .....\$113.00\*

2.50% carbon ..... 118.00\*

2% carbon ..... 123.00\*

1% carbon ..... 133.00\*

#### Other Ferroalloys

Ferrotungsten, per lb. contained W, del. carload..... \$2.00

Ferrotungsten, 100 lb. and less 2.25

Ferrovandium, contract, per lb. contained V, del'd \$2.70 to \$2.90†

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots ..... \$2.25†

Ferrocobaltitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace, carload and contract, per net ton.....\$142.50

Ferrocobaltitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton.....\$157.50

\*Spot prices are \$5 per ton higher.

†Spot prices are 10c. per lb. of contained element higher.

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton ..... 58.50

Ferrophosphorus, electrolytic 23-26% in carlots, f.o.b. Monsato (Siglo), Tenn., 24%, per gross tons, \$3 unitage, freight equalized with Nashville ..... 75.00

Ferromolybdenum, per lb. Mo, f.o.b. furnace ..... 95c.

Calcium molybdate, per lb. Mo, f.o.b. furnace ..... 80c.  
Molybdenum oxide briquettes 48-52% Mo, per lb. contained Mo, f.o.b. Langeloth, Pa. 80c.

### FUEL OIL

No. 3, f.o.b. Bayonne, N. J.....4.50c.  
No. 6, f.o.b. Bayonne, N. J.....2.98c.  
No. 5 Bur. Stds., del'd Chicago..3.25c.  
No. 6 Bur. Stds., del'd Chicago..2.75c.  
No. 3 distillate, del'd Cleveland..5.50c.  
No. 4 industrial, del'd Cleveland.5.00c.  
No. 5 industrial, del'd Cleveland.4.75c.  
No. 6 industrial, del'd Cleveland.4.50c.



## One for the Book!

HERE'S a report, from a metal finishing plant, that will have a prominent place in the Wyandotte Record Book:

The plant is using Wyandotte C.S.R. cleaner for cleaning polished steel stampings prior to bright nickel plating directly on the steel.

Here's the report: No cyanide dip or copper strike in the line. Parts are assembled in jig, and after bright nickel plating, followed by chrome plating, they are spot-welded with absolutely *no lifting of the plate*.

Your Wyandotte Representative will be glad to show you what Wyandotte C.S.R.—or any Wyandotte Metal Cleaning Compound—can do for you. Write us.

**Wyandotte**  
THE J. B. FORD SALES CO. SERVICE REPRESENTATIVES IN 88 CITIES  
**WYANDOTTE MICH.**

# PRICES

## COKE

Per Net Ton

Furnace, f.o.b. Connellsville, prompt .....	\$5.25 to \$5.75
Foundry, f.o.b. Connellsville, prompt .....	\$5.50 to \$6.00
F'dry, by-product, Chicago.....	10.50
F'dry, by-product, New England	13.00
Foundry, by-product, Newark or Jersey City .....	\$11.30 to \$11.90.
F'dry, by-product, Philadelphia.	11.13
F'dry, by-product, Cleveland...	11.55
F'dry, by-product, Cincinnati...	11.00
Foundry, Birmingham .....	7.50
F'dry, by-product, St. Louis	
	\$10.75 to \$11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports.....	\$14.75

## BRITISH

British

Per Gross Ton, f.o.b. United Kingdom Ports

Ferromanganese, export. £29	16s. 3d.
Tin plate, per base box. 32s. to 33s.	
Steel bars, open hearth.. £16	10s.
Beams, open hearth.... £15	8s.
Channels, open hearth... £15	8s.
Angles, open hearth... £15	8s.

Black sheets, No. 24, gage  
£22 5s. max.\* £22 5s. min.\*\*

Galvanized sheets, No. 24 gage  
£25 12s. 6d. max.\*; £25 12s. 6d. min.\*\*

\*Empire markets only.

\*\*Other than Empire markets.

## PIG IRON (Per Gross Ton)

Prices delivered various consuming points indicated by bold italics

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phos.
Boston .....	<b>\$25.50</b>	<b>\$25.00</b>	<b>\$26.50</b>	<b>\$26.00</b>	.....
Brooklyn .....	<b>27.50</b>	.....	.....	<b>28.00</b>	.....
Jersey City .....	<b>26.53</b>	<b>26.03</b>	<b>27.53</b>	<b>27.03</b>	.....
Philadelphia .....	<b>25.84</b>	<b>25.34</b>	<b>26.84</b>	<b>26.34</b>	.....
Bethlehem, Pa. ....	\$25.00	\$24.50	\$26.00	\$25.50	.....
Everett, Mass. ....	25.00	24.50	26.00	25.50	.....
Swedeland, Pa. ....	25.00	24.50	26.00	25.50	.....
Steelton, Pa. ....	.....	24.50	.....	.....	<b>28.50</b>
Birdsboro, Pa. ....	25.00	24.50	26.00	25.50	<b>28.50</b>
Sparrows Point, Md. ....	25.00	24.50	.....	.....	.....
Erie, Pa. ....	24.00	<b>23.50</b>	25.00	24.50	.....
Neville Island, Pa. ....	24.00	<b>23.50</b>	24.50	24.00	.....
Sharpsville, Pa. †† .....	24.00	<b>23.50</b>	24.50	24.00	.....
Buffalo .....	24.00	<b>23.00</b>	25.00	24.50	<b>28.50</b>
Cincinnati .....	<b>24.44</b>	<b>24.61</b>	.....	<b>25.11</b>	.....
Canton, Ohio .....	<b>25.39</b>	<b>24.89</b>	<b>25.89</b>	<b>25.39</b>	.....
Mansfield, Ohio .....	<b>25.94</b>	<b>25.44</b>	<b>26.44</b>	<b>25.94</b>	.....
St. Louis .....	<b>24.50</b>	<b>24.02</b>	.....	.....	.....
Chicago .....	24.00	23.50	24.50	24.00	.....
Granite City, Ill. ....	24.00	23.50	24.50	24.00	.....
Cleveland .....	24.00	23.50	24.50	24.00	.....
Hamilton, Ohio .....	24.00	23.50	.....	24.00	.....
Toledo .....	24.00	23.50	24.50	24.00	.....
Youngstown †† .....	24.00	23.50	24.50	24.00	.....
Detroit .....	24.00	23.50	24.50	24.00	.....
St. Paul .....	<b>26.63</b>	.....	<b>27.13</b>	<b>26.63</b>	.....
Duluth .....	24.50	.....	25.00	24.50	.....
Birmingham .....	19.38*	18.00	24.00	.....	.....
Los Angeles, San Francisco and Seattle .....	<b>27.50</b>	.....	.....	.....	.....
Provo, Utah .....	22.00	.....	.....	.....	.....
Montreal † .....	27.50	27.50	.....	28.00	.....
Toronto † .....	25.50	25.50	.....	26.00	.....

## GRAY FORGE

Valley or Pittsburgh fee.....\$24.50

## CHARCOAL

Lake Superior fee.....\$27.00  
Delivered Chicago ..... 30.34

Base prices are subject to an additional charge for delivery within the switching limits of the respective districts.

\*Delivered prices on Southern iron for shipment to Northern points are 38c. a ton below delivered prices from nearest Northern basing point on iron with phosphorus content of 0.70 per cent and over. †On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

## WAREHOUSE PRICES

(Base Prices, Dollars per 100 lb., Delivered Metropolitan Areas)

	Pitts- burgh	Chicago	Cleve- land	Phila- delphia	New York	Detroit	Buffalo	Boston	Birm- ingham	St. Louis	St. Paul	Mil- waukee	Los Angeles
Sheets, hot rolled .....	\$3.15	\$3.05	\$3.15	\$3.55	\$3.58	\$3.23	\$3.05	\$3.51	\$3.45	\$3.19	\$3.30	\$3.48	\$4.30
Sheets, cold rolled .....	.....	4.10	4.05	4.05	4.40	4.30	4.30	4.58	.....	4.12	4.35	4.43	6.50
Sheets, galvanized .....	4.75	4.60	4.42	4.90	5.00	4.64	4.60	5.11	4.75	4.95	4.75	4.98	5.25
Strip, hot rolled .....	3.40	3.40	3.30	3.95	3.96	3.48*	3.62	3.86	3.70	3.54	3.65	3.73	.....
Strip, cold rolled .....	3.20	3.30	3.20	3.31	3.51	3.20	3.22	3.26	.....	3.41	3.83	3.54	.....
Plates .....	3.40	3.55	3.40	3.55	3.76	3.60	3.62	3.85	3.35	3.47	3.80	3.68	4.00
Structural shapes .....	3.40	3.55	3.58	3.55	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.15
Bars, hot rolled .....	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	4.15
Bars, cold finished .....	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300.	7.20	7.10	7.55	7.31	7.35	7.42	7.35	7.50	.....	7.47	7.45	7.33	9.40
Bars, ht. rld. SAE 3100.	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	.....	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300.	8.15	8.15	8.15	8.56	8.59	8.45	8.40	8.63	.....	8.52	8.84	8.38	10.65
Bars, cd. drn. SAE 3100.	6.75	6.75	6.75	7.16	7.19	7.05	6.75	7.23	.....	7.12	7.44	6.98	9.80

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb.; galvanized sheets, 450 to 1499 lb.; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb.; galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb.; galvanized sheets, 500 to 1499 lb.; Milwaukee, cold rolled sheets, 400 to 1499 lb.; galvanized sheets, 150 to 499 lb.; New York, hot rolled sheets, 0 to 1999 lb.; cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, shapes, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 150 to 1049 lb. Extras for size, quality, etc., apply on above quotations. \*12 gage and heavier, \$3.23.



1941 January 1941						
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

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**PERIODIC CONSULTATION  
SERVICE**

*to help secure efficient,  
full-time machine operation*



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tion and reduce mainte-  
nance costs by putting this  
valuable service to work  
in your plant.**

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To offset mounting non-con-  
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and reducing costs for  
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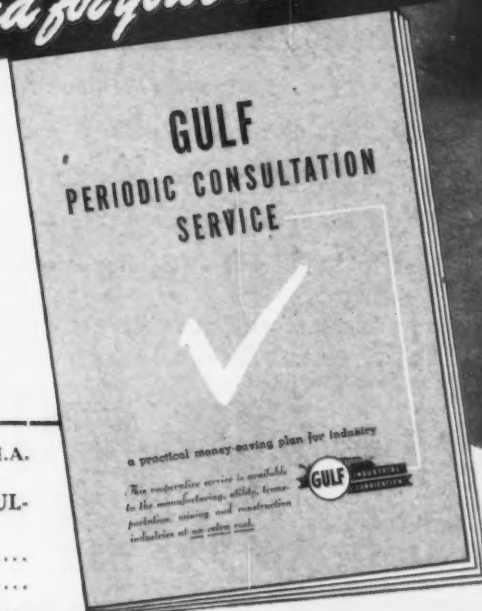
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*Send for your booklet*





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An example of economy with serviceability by standardizing on Molybdenum steels: a manufacturer of speed reducing equipment uses Chromium-Molybdenum, SAE 4140, for gears and SAE 4150 for pinions.

Treated to 24-28 and 28-34 Rockwell "C" respec-

tively, these two readily available, low cost and easily machinable steels comfortably meet the toughness and hardness requirements of the service.

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**500 Fifth Avenue New York City**

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# Sales Possibilities

... CONSTRUCTION, PLANT EXPANSION AND EQUIPMENT BUYING

## North Atlantic States

• **Bullard Co.**, Bridgeport, Conn., machine tools and parts, has let general contract to Turner Construction Co., 420 Lexington Avenue, New York, for new plant on 13-acre tract near present plant, for production of equipment for Government, which has provided a fund of \$3,500,000 for buildings and machinery. A. D. Crossett is company architect.

**General Electric Co.**, Schenectady, N. Y., plans one-story addition to branch plant at Meriden, Conn. Cost over \$100,000 with equipment.

**William F. Lacey & Sons Co.**, 50 Mystic Avenue, Medford, Mass., motor truck bodies, parts, etc., has let general contract to Frankini Construction Co., for new one-story body shop, 70 x 115 ft. Cost over \$50,000 with equipment.

**Novelad Co.**, South Norwalk, Conn., recently organized to manufacture metal products, electric display equipment and other specialties, has leased a one-story building at 49 Day Street, 115 x 190 ft., totaling over 30,000 sq. ft. of floor space, for plant.

**Production Tool & Die Co., Inc.**, 562 St. James Avenue, Springfield, Mass., tools, gages, dies, etc., plans one-story machine shop addition. Cost close to \$50,000 with equipment.

**State Board of Education**, Hartford, Conn., and Board of Education, New Haven, Conn., have given joint approval for new multi-story trade school at latter place. Cost estimated at \$700,000 for building and equipment. Work will proceed as soon as authority has been granted by General Assembly of State. Joseph A. Fitzgerald is superintendent of New Haven schools.

**Remington Arms Co.**, Bridgeport, Conn., has closed agreement with War Department, for construction and operation of new plant near Denver, for production of cartridges, including power house, pumping station and other structures. Cost about \$25,000,000, with financing to be provided by Government.

**Combustion Engineering Co.**, 200 Madison Avenue, New York, has let contract to Converse Bridge & Steel Co., 2408 Vance Avenue, Chattanooga, Tenn., for one-story addition to boiler and tank works of Hedges-Walsh-Weidner Division, Chattanooga, 89 x 309 ft., for storage and distribution. Cost close to \$100,000 with equipment.

**Joseph Aronauer, Inc.**, 133 Chrystie Street, New York, bed springs, etc., has purchased three-story and basement building at 1535-39 Sixty-third Street, Brooklyn, about 45,000 sq. ft. of floor space, and will remodel for expansion.

**Fairchild Engine & Airplane Corp.**, Farmingdale, L. I., plans one-story additions for expansion in parts production and assembling departments, with output for Navy Department. Fund of about \$1,478,000 will be furnished by Government for buildings and equipment.

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids (no closing date stated) for seven electric traveling bridge cranes for Brooklyn Navy Yard (Specifications 10225).

**Jefferson-Travis Radio Mfg. Corp.**, 136 West Fifty-second Street, New York, radio equipment and parts, has leased about 16,000 sq. ft. of floor space in building at 374-80 Second Avenue for expansion to handle Federal contracts.

**I. B. Kleinert Rubber Co.**, 485 Fifth Avenue, New York, general rubber goods, has approved plans for three-story addition to plant

at 20-09 128th Street, College Point, L. I. Cost close to \$200,000 with equipment. Aspinwall & Simpson, South Station Plaza, Great Neck, L. I., are architects.

**Crescent Tool Co.**, Harrison Street, Jamestown, N. Y., wrenches, pliers, etc., has let general contract to J. M. Benzinger, 121 West Fourth Street, for one-story addition, 50 x 135 ft., for a heat-treating unit. Cost over \$60,000 with equipment.

**Howard Iron Works, Inc.**, 281 Chicago Street, Buffalo, machinery and parts, plans rebuilding part of two-story plant recently destroyed by fire. Loss over \$75,000 with equipment.

**Buffalo Arms Corp.**, 537 East Delavan Avenue, Buffalo, recently organized subsidiary of Houdaille-Hershey Corp., National Bank Building, Detroit, automobile equipment, operating Houde Engineering Co., first noted address, has let general contract to George A. Fuller Co., 597 Madison Avenue, New York, for new plant at Cheektowaga, N. Y., for production of small fire arms for Government. It will comprise main one-story unit, 400 x 700 ft., and several smaller buildings. Cost over \$5,000,000 with equipment. Houde company will supervise erection and equipment installation.

**Irvington Smelting & Refining Works**, 374 Nye Avenue, Irvington, N. J., plans one-story addition, 110 x 150 ft., including improvements in present plant. Cost over \$70,000 with equipment. Eppler & Kahrs, 15 Washington Street, Newark, N. J., are architects.

**Otis Elevator Co.**, 260 Eleventh Avenue, New York, has arranged with War Department, Washington, for construction and operation of new plant at its works, Harrison, N. J., for production of crank cases for aircraft engines, to cost about \$6,954,000 with equipment. Company will furnish funds for project, which Government will repay over a five-year period.

**Fischer Casting Co.**, Green Brook Road, North Plainfield, N. J., iron and other metal castings, plans two-story addition, 75 x 80 ft. Cost over \$55,000 with equipment.

**Public Service Electric & Gas Co.**, Public Service Terminal Building, Newark, N. J., has authorized fund of about \$17,000,000 for expansion and improvements in electric plants and system during 1941, considerable part of appropriation to be used at Marion generating station, Jersey City, and power plant at Burlington, N. J., where extensions are in progress to increase capacities. Budget also includes fund of \$2,500,000 for expansion in artificial gas plant in West End district, Jersey City.

**Molded Insulation Co.**, 335 East Price Street, Philadelphia, plastic products, has let general contract to John A. Robbins Co., Inc., 10 South Eighteenth Street, for three-story addition, 50 x 175 ft. Cost about \$125,000 with equipment. F. Dickinson Shaw, 34 South Seventeenth Street, is consulting engineer; John W. Keyes, 112 South Sixteenth Street, is architect.

**R. F. Sedgley, Inc.**, 2311 North Sixteenth Street, Philadelphia, fire arms, has acquired three-story and basement building at J and Ontario Streets, for expansion.

**McClave Co.**, 936 Hamilton Street, Allentown, Pa., mechanical equipment, plans new one-story plant, 40 x 100 ft., for a foundry and machine shop. Cost close to \$45,000 with equipment.

**Hagan Corp.**, Bowman Building, Pittsburgh, chemical engineer, plans new plant on 80-acre tract near city, for production of chemicals, water-conditioning compounds and kindred specialties, for Government, with facilities for employment of about 500 persons. Cost about \$600,000 with equipment.

**United Engineering & Foundry Co.**, First National Bank Building, Pittsburgh, rolling mill machinery and other heavy equipment, gears, etc., plans expansion in plant at Vandergrift, Pa., including foundry units for production of large steel castings. New annealing furnace and auxiliary equipment will be installed. Cost over \$200,000.

**Berry Tool & Machine Corp.**, 329 West Twelfth Street, Erie, Pa., machine specialties, tools, etc., has let general contract to Martin Schenker & Son, 3901 Fruit Street, for one-story addition, 50 x 120 ft. Cost close to \$50,000 with equipment.

**Westinghouse Electric & Mfg. Co.**, East Pittsburgh, has contracted with Navy Department, Washington, for expansion in branch plant at Jersey City, N. J., for manufacture of ordnance for Government. Fund of \$295,000 has been arranged for equipment purchases.

**Commanding Officer**, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Jan. 20 for spinning machines (Circular 1393), shovels (Circular 1401), flooring nails (Circular 1400).

**Purchase Section**, National Bureau of Standards, Washington, asks bids until Jan. 21 for lathes and attachments.

**E. I. du Pont de Nemours & Co., Inc.**, Explosives Department, du Pont Building, Wilmington, has contracted with Navy Department for additions to Naval powder factory, Indian Head, Md., including one-story buildings and equipment. Appropriation of \$3,490,000 has been authorized for project.

**Procurement Division**, Veterans' Administration, Washington, asks bids until Jan. 21 for steel wool (Circular G-193); until Jan. 20 for gas-fired bake ovens (Circular M-327).

## The South

• **Solvay Process Co.**, 40 Rector Street, New York, plans new works at West Henderson, Ky., for production of synthetic ammonia, to be constructed and operated for War Department on cost-plus-fixed-fee basis. It will comprise one and multi-story buildings, power house, machine and mechanical shops, pumping station and other structures. Cost about \$11,100,000 with equipment.

**J. W. Jackson Beverage Co.**, 412 South Seventeenth Street, Wilmington, N. C., has let general contract to W. A. Simon, 309 Marsteller Street, for new mechanical-bottling, storage and distributing plant on six-acre tract at Nineteenth and Dawson Streets, with main two-story structure, 125 x 200 ft., and smaller one-story units. A service and garage building for company trucks will be built. Cost about \$125,000 with equipment, including air-conditioning system.

**Director of Purchases**, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Jan. 20 for one 300-kva. gasoline engine-driven generating unit for Watts Bar hydroelectric power plant.

**Triton Chemical Co., Inc.**, Penns Grove, N. J., has acquired about 1800 acres in Botetourt County, near Glen Wilton, Va., for new plant for production of explosives, with power house, pumping station, machine shop and auxiliary buildings. Cost over \$1,500,000 with equipment.

**Carolina Power & Light Co.**, Raleigh, N. C., plans new steam-electric generating plant near city, installation to include turbine-generator unit with capacity of 40,000-hp., condensers, high-pressure boilers and auxiliary equipment. Cost estimated about \$3,000,000.

**Public Works Officer**, Naval Air Station,

## SALES POSSIBILITIES

Pensacola, Fla., asks bids until Jan. 29 for air-conditioning equipment for local station (Specifications 9727).

**Gaylord Container Corp.**, Pulp and Paper Division, 2820 South Eleventh Street, St. Louis, will carry out expansion and improvements in pulp and paper mill at Bogalusa, La., including additions to pulp mill, bag and container-manufacturing departments, power house and other expansion. Cost close to \$6,000,000 with machinery, for which various awards are being made.

**Southern Wheel Division of American Brake Shoe & Foundry Co.**, 3100 Washington Avenue, Houston, Tex., has let general contract to R. N. Hancock, Sterling Building, for two one-story additions and improvements in present plant. Cost over \$60,000 with equipment. Main offices are at 230 Park Avenue, New York.

**McCullum Exploration Co.**, Esperson Building, Houston, Tex., plans new gas recycling plant for natural gasoline production near McAllen, Tex., with compressor station, boiler house, steel tank storage division and other facilities. Cost over \$400,000 with equipment.

**Consolidated Aircraft Corp.**, San Diego, Cal., has arranged with War Department for construction and operation of new plant at Fort Worth, Tex., for assembling of long-range, four-motor, bomber-type airplanes, with storage and distributing buildings, power house and auxiliary structures. Erection will be carried out under supervision of U. S. Engineers Office. Cost about \$10,000,000.

### Central States

• **Ridge Tool Co.**, Ridge Road, Elyria, Ohio, with plant at North Ridgeville, near Elyria, will take bids soon on general contract for new one-story plant on 30-acre tract on Highway No. 20. Cost over \$100,000 with equipment. A. G. Hall, 964 Brunswick Road, Cleveland Heights, Ohio, is architect and engineer.

**General Electric Co.**, Lamp Department, Nela Park, Cleveland, plans new factory for production of lamp bases on 10-acre tract near Conneaut, Ohio, comprising main one-story units for manufacturing division, storage and distribution. Cost about \$250,000 with equipment.

**Cleveland Pneumatic Tool Co.**, 3734 East Seventy-eighth Street, Cleveland, has let general contract to Sam W. Emerson Co., 1836 Euclid Avenue, for one-story addition. Cost close to \$100,000 with equipment. Ernest McGeorge and William Hargett, Associated, 9400 Quincy Avenue, are engineers.

**Inland Mfg. Division, General Motors Corp.**, Dayton, Ohio, plastic products, will begin superstructure soon for two-story addition, 120 x 150 ft., for which general contract recently was let to Frank Messer & Sons, Inc., 2515 Burnet Avenue, Cincinnati. Cost over \$150,000 with equipment. Argonaut Realty Division, General Motors Research Building, Detroit, is engineer.

**Bendix-Westinghouse Automotive Air Brake Co.**, 5001 Centre Avenue, Pittsburgh, with plant at Wilmerding, near Pittsburgh, has plans for new one-story plant, 240 x 525 ft., at Elyria, Ohio. Cost close to \$200,000 with equipment.

**Midwest Piping & Supply Co., Inc.**, 1450 South Second Street, St. Louis, pipe coils and bends, welded pipe, etc., has let general contract to Fruin-Colnon Contracting Co., Merchants' Laclede Building, 408 Olive Street, for one-story addition, 100 x 140 ft. Cost over \$75,000 with equipment.

**Muskegon Motor Specialties Co.**, Muskegon, Mich., automotive parts and equipment, has let general contract to Peter Ramberg, Muskegon, for one-story addition for production of camshafts for aircraft engines to be manufactured by Packard Motor Car Co., Detroit, for Government. Cost over \$70,000 with equipment.

**Howell Electric Motors Co.**, Howell, Mich., electric motors and parts, has let general con-

tract to H. G. Christman-Lansing Co., Kalamazoo Plaza, Lansing, Mich., for one-story addition, 80 x 125 ft. Cost over \$75,000 with equipment. Giffels & Vallet, Inc., Marquette Building, Detroit, is architect and engineer.

**Magnesium Fabricators, Inc.**, Adrian, Mich., magnesium castings, a division of Bohn Aluminum & Brass Corp., Detroit, has let general contract to Kriehoff Co., 6661 French Road, Detroit, for one-story addition. Cost over \$85,000 with equipment. Bohn company has expansion under way at different plants to represent total investment of about \$3,000,000, of which approximately \$2,000,000 will be used for machinery and other equipment.

**Stubnitz-Greene Spring Corp.**, Adrian, Mich., steel cushion springs, etc., is erecting a one-story addition, 80 x 200 ft., for which general contract recently was let to Robb-Ott Co., Adrian. Cost over \$70,000 with equipment.

**Electro-Motive Corp.**, Division of General Motors Corp., La Grange, Ill., diesel-electric locomotives, parts, etc., will take bids soon on general contract for one-story addition, 250 x 350 ft. Cost close to \$300,000 with equipment. An air-conditioning system will be installed. J. Lloyd Allen, Architects' and Builders' Building, Indianapolis, is architect.

**Goss Printing Press Co.**, 1535 South Paulina Street, Chicago, will build one-story addition for production of ordnance for Navy Department, for which contract has been secured. Fund of \$864,600 will be provided by Government, of which close to \$360,000 will be expended for machine tools, and remainder for building and other equipment.

**Universal Foundry Co.**, 61 Pine Street, Oshkosh, Wis., gray iron castings, has let general contract to B. B. Ganther Co., 78 State Street, for one-story addition, 80 x 80 ft. Cost over \$40,000 with equipment.

**City Council**, Maquoketa, Iowa, asks bids until Jan. 31 for diesel engine-generator unit and accessories for municipal power plant. Cost close to \$70,000.

**Triangle Auto Parts Co.**, 3650 North Ashland Avenue, Chicago, automobile parts and equipment, has let general contract to Olson & Danielson, Inc., 6429 North Francisco Avenue, for one-story addition, 25 x 104 ft. Cost close to \$45,000 with equipment. M. D. Hetherington, 10153 South Prospect Avenue, is architect.

**Chicago Rivet & Machine Co.**, 1830 South Fifty-fourth Street, Cicero, has let general contract to E. L. Lonergan Construction Co., 203 North Wabash Avenue, Chicago, for new one-story plant, about 110,000 sq. ft. of floor space, at Bellwood, Ill. Cost over \$350,000 with equipment. Engineering Systems, Inc., 221 North LaSalle Street, Chicago, is architect and engineer.

**Superior Water, Light & Power Co.**, Superior, Wis., plans new steam-electric generating station. Cost close to \$1,000,000 with turbine-generator unit and accessories, high-pressure boilers and auxiliary equipment.

### Western States

• **Gillfillan Brothers, Inc.**, 1815 Venice Boulevard, Los Angeles, field radios and parts, refrigerating equipment, etc., has let general contract to Stanton-Reed Co., 816 West Fifth Street, for new one-story plant on adjoining site, about 35,000 sq. ft. of floor space, to replace part of works recently destroyed by fire. Cost over \$100,000 with equipment. Llewellyn A. Parker, Architects' Building, is architect.

**Los Angeles Bureau of Power and Light**, 207 South Broadway, Los Angeles, plans new steam-electric generating plant in harbor district at Wilmington, to cost approximately \$4,215,000, of which about \$2,150,000 will be expended for turbine-generators and accessories, high-pressure boilers, switchyard structures and auxiliary equipment.

**Bureau of Reclamation**, Denver, asks bids until Jan. 20 for two 11.25 ft. by 13.67 ft. fixed-wheel gates for installation at inlets of penstocks for unit No. 7, Minidoka hydroelectric power plant, Minidoka project, Idaho (Specification 1462-D); two motor-driven gate hoists for operating wheel gates (Specification 1463-D).

**Abegg & Reinhold Co., Ltd.**, Twenty-sixth and Harriett Streets, Vernon, Los Angeles, oil well tools and equipment, has approved plans for one-story heat-treating unit, 60 x 120 ft. Cost close to \$45,000 with equipment.

**National Steel Construction Co.**, 425 Frontenac Street, Seattle, steel products, plans one-story addition. Cost close to \$65,000 with equipment.

**Constructing Quartermaster**, Hill Field, Ogden, Utah, has let general contract to James I. Barnes Construction Co., Bay Builders' Exchange Building, Santa Monica, Cal., for one-story airplane repair shop for Air Corps, 310 x 752 ft., at \$751,000 exclusive of equipment, which will be purchased under separate contracts.

**Soundview Pulp Co.**, Everett and Federal Avenues, Everett, Wash., plans addition to boiler plant at local pulp mill. Cost close to \$60,000 with boiler units and auxiliary equipment.

### Canada

• **Montreal Locomotive Works, Ltd.**, 215 St. James Street West, Montreal, has let general contract to Sutherland Construction Co., Ltd., 1440 Ste. Catherine Street West, for one-story addition, 400 x 800 ft., at Tongue Pointe plant, for manufacture of ordnance for Department of Munitions and Supply. Cost close to \$900,000 with machinery.

**General Motors of Canada, Ltd.**, Oshawa, Ont., has asked bids on general contract for one-story addition, 60 x 200 ft. Cost over \$85,000 with equipment.

**International Flare Signal Co., Ltd.**, Waterloo, Que., signal devices and equipment, plans one-story addition. Cost close to \$65,000 with equipment.

**Carling-Kuntz Breweries, Ltd.**, 155 King Street South, Waterloo, Ont., is erecting one-story addition, for which general contract recently was let to Dunker Construction Co., Ltd., Kitchener, Ont. Cost about \$70,000 with equipment.

**William Kennedy & Sons, Ltd.**, Owen Sound, Ont., manufacturer of castings, machinery, etc., plans erection of one-story addition, 40 x 200 ft.

**Dominion Department of National Defense**, Hon. J. L. Ralston, Ottawa, Minister, plans erection of a \$250,000 munitions plant at Quebec.

### Trade Notes

**Chelsea Fan & Blower Co., Inc.**, has purchased a new plant and will make its headquarters at Olsen and Grove Streets, Irvington, N. J.

**Iron & Steel Products, Inc.**, Chicago, has discontinued its St. Louis branch representation and will handle that territory directly.

**H. O. Bates**, Elizabeth, N. J., has been incorporated under the name of The Acromark Corp. with the same personnel, effective Jan. 1, 1941.

**Hygrade Sylvania Corp.**, Salem, Mass., announces substantial reductions in prices of Hygrade fluorescent lamps, effective Jan. 1, 1941. Reductions average 10 per cent to 15 per cent.